

JOURNAL OF
THE AMERICAN
MUSEUM OF NATURAL HISTORY
VII

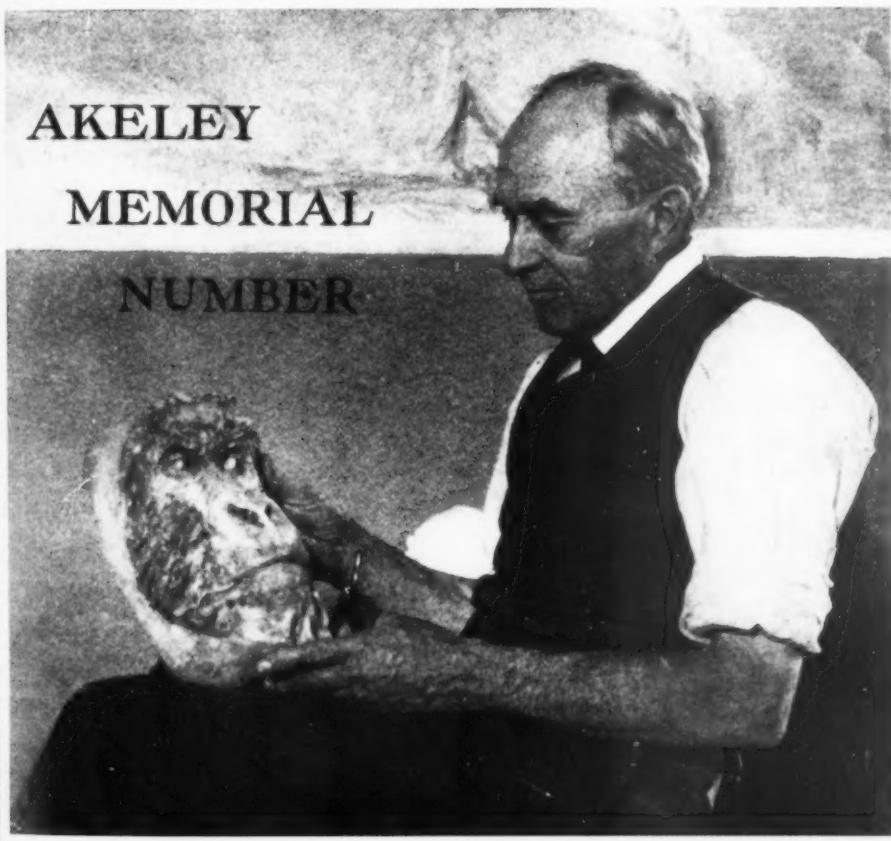
MARCH-APRIL, 1927

No. 2

NATURAL HISTORY

AKELEY
MEMORIAL

NUMBER



JOURNAL OF THE AMERICAN
MUSEUM OF NATURAL HISTORY
EXPLORATION·RESEARCH·EDUCATION

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NATURAL HISTORY

THE JOURNAL OF THE AMERICAN MUSEUM

DEVOTED TO NATURAL HISTORY,
EXPLORATION, AND THE DEVELOP-
MENT OF PUBLIC EDUCATION
THROUGH THE MUSEUM



AKELEY MEMORIAL NUMBER

FREDERIC A. LUCAS, EDITOR

MARCH-APRIL, 1927

[Published May, 1927]

VOLUME XXVII, NUMBER 2

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NATURAL HISTORY

VOLUME XXVII

CONTENTS FOR MARCH-APRIL

NUMBER 2

Cover: "Thinking about the Gorilla."

Taken in 1925, shortly after Mr. Akeley's return from the Gorilla Expedition.

"To a Traveler".

Frontispiece: Carl Akeley. facing 115

From his last photograph, January, 1926

Akeley, the Conservationist. BARON DE CARTIER DE MARCHIENNE 115
With maps of the Gorilla Sanctuary

Akeley, the Explorer. KERMIT ROOSEVELT 118
With photograph of old cow elephant secured for Akeley's group

Akeley, the Sculptor. JAMES EARLE FRASER 120
With reproductions of groups illustrating lion spearing

Akeley, the Inventor. T. TRUBEE DAVISON 124
Illustrated with photographs of the Akeley cameras and the Akeley cement gun

Akeley, the Man. GEORGE H. SHERWOOD 130
With studio portrait of Akeley

Carl Akeley's Early Work. WILLIAM M. WHEELER 133
Portrait showing Akeley shortly after he went to the Field Museum

Akeley as a Taxidermist. FREDERIC A. LUCAS 142
A chapter in the history of Museum methods
Illustrated

Groups in the Field Museum and Elsewhere. 153
Examples of Akeley's methods of taxidermy

In Africa with Akeley. MARY HASTINGS BRADLEY 161
Reminiscences of the Belgian Congo Akeley Expedition. 1921-1922
Illustrated

Scenes from Akeley's Africa. facing 172
Photographs taken by Martin Johnson during the present Martin Johnson African Expedition

Epilogue. HENRY FAIRFIELD OSBORN 173

Notes. 175

Published bimonthly, by the American Museum of Natural History, New York, N. Y. Subscription price \$3.00 a year.

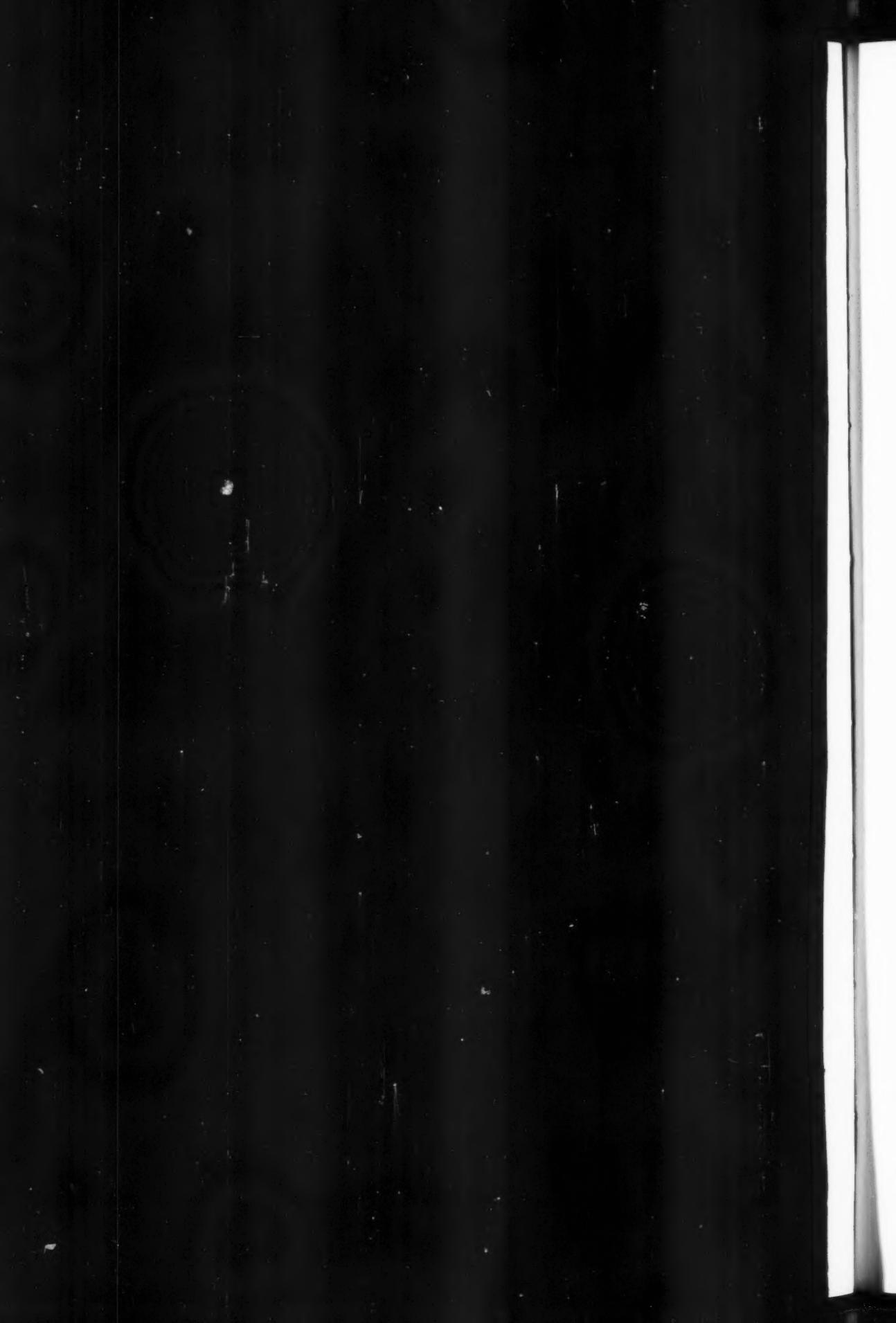
Subscriptions should be addressed to James H. Perkins, Treasurer, American Museum of Natural History, 77th St. and Central Park West, New York City.

NATURAL HISTORY is sent to all members of the American Museum as one of the privileges of membership.

Entered as second-class matter April 3, 1919, at the Post Office at New York, New York, under the Act of August 24, 1912.

Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized on July 15, 1918.





To a Traveler*

The mountains and the lonely death at last,
Upon the lonely mountains: O strong Friend!
The wandering over, and the labor passed,
Thou art indeed at rest:
Earth gave thee of her best,
That labor and this end.

Earth was thy mother, and her true son thou:
Earth called thee to a knowledge of her ways,
Upon the great hills, up the great streams; now
Upon earth's kindly breast
Thou art indeed at rest:
Thou, and thine arduous days.

Fare thee well, O strong heart! the tranquil night
Looks calmly on thee: the sun pours down
His glory over thee, O heart of might!
Earth gives thee perfect rest:
Earth, whom thy swift feet pressed:
Earth, whom the vast stars crown.

*Lines by Lionel Johnson, quoted by Kermit Roosevelt at the Akeley Memorial Meeting, December 23, 1926.



Photograph by Julius Kirschner

CARL ACELEY

From his last photograph, January, 1926

"He had breadth of vision and depth of vision, but most of all he had simplicity, and this it seems is the mark of true greatness."—H. J. SPINDEN

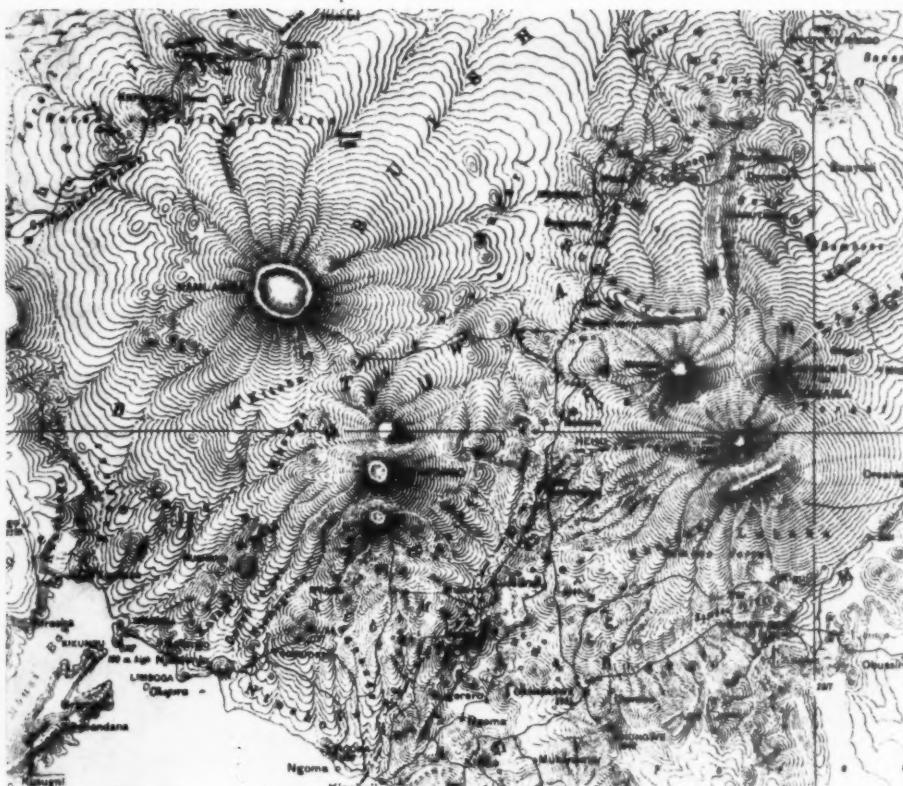


NATURAL HISTORY

VOLUME XXVII

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The Gorilla Sanctuary, Parc National Albert and adjoining territory. The three volcanoes at the right are included in the boundaries of the preserve

Akeley, the Conservationist¹

BY BARON DE CARTIER DE MARCHIENNE

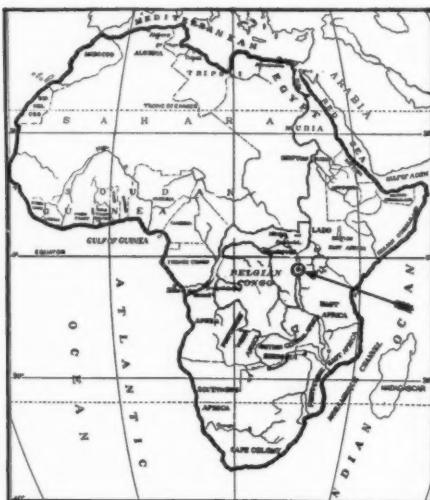
FOR many years Carl Akeley has been one of the leading conservationists in America. He was one of the charter members and also a member of the Board of Directors of the John Burroughs Memorial Association which has done so much for the conservation of bird life. He took a prominent part in forestry conservation, notably in the conservation of the great Redwood trees. He was a very active member of the National Parks

Association and an influential promoter of their ideals, namely, to preserve nature and win all America to its appreciation and study; to promote the use of national parks for popular education and scientific investigation; to protect wild birds, animals, and plants, and to conserve typical areas under primitive conditions.

As an indication of his varied activities for conservation I may mention that he was an active member of the

¹This and the following four articles are from addresses made at the Akeley Memorial Meeting held on December 21, 1926, at the American Museum.

New York State Forestry Association, the American Scenic and Historic Preservation Society, the National Audubon Society, the Roosevelt Memorial Association, and other similar associations. In all of these societies, Akeley was more than a member, he



The location of the Gorilla Sanctuary, Parc National Albert

was a leading spirit, and in his lectures, in his books, and in his numerous articles, he earnestly and effectively pleaded the need of conservation.

The movement for conservation in America, in which Akeley has played so great a part, has found a hearty echo in Europe and especially in those countries which have tropical colonies, where animal life still exists in its natural environment. In this connection I may mention the work now carried on by the Belgian Cercle Zoologique Congolais, under the presidency of Doctor Derscheid of Brussels, who is at the present moment in Africa, where he saw Akeley a short time before his tragic death. I should also mention the activities of the Nederlandsche Commissie voor Internationale Naturbescherming which,

under the very competent guidance of Mr. P. G. van Tiehoven, of Amsterdam, has inaugurated an international movement for conservation.

During the last years of Akeley's life it was my great privilege not only to have the pleasure of his personal friendship, but also to be associated rather closely with him in our efforts to preserve the fauna and flora of the Belgian Congo.

Akeley, like Saint Francis of Assisi, had a great and kind heart, full of sympathetic understanding for "God's humbler creatures." Although he was counted "a mighty hunter," he never killed for the sake of killing. He could kill wild beasts for protection, for food, or for the legitimate purposes of science; but his soul revolted against the wanton destruction of innocent animals or rare species whose conservation is necessary for scientific study.

As he told me, Akeley, during his trips to Central Africa, became especially impressed by the brutal slaughter of the gorillas by so-called "sportsmen" who destroyed these inoffensive animals for no other purpose than to boast of a bigger bag than rival hunters. Akeley had discovered in his rambles that a few hundred gorillas had taken refuge in the Kivu District, and when King Albert decided that a sanctuary for the fauna and flora of those regions should be created there, no one greeted this idea more enthusiastically than our friend.

No doubt King Albert, who planned this sanctuary which is called Parc National Albert, was influenced by his past experiences when he traveled far and wide in this country. The main idea of His Majesty is that the flora and fauna be maintained in their natural surroundings so that they may be studied under the most favorable

conditions by the reputable scientists of the present day and of future generations. The Parc National Albert, in which Akeley was so interested, now embraces the three volcanoes, Visoke, Karissimbi, and Mount Mikeno. In the creation of the Parc National Albert we have had the constant advantage of Akeley's experience, as well as the most valuable collaboration of Doctor Merriam, Doctor Osborn, Doctor Hornaday, and others.

Before sailing on his last fateful journey to the Congo which he loved so well, Akeley was received in Brussels by King Albert, who explained to him at length his views on the organization of the national park named after His Majesty. Alas, death has prevented Akeley from accomplishing his design to follow the river Congo to the sea, as did that other illustrious American, Henry Stanley, nearly fifty years ago. He would have seen with his own eyes the wonderful development achieved since that time and often against almost insuperable obstacles through Belgian efforts in Central Africa. This sanctuary of fauna and flora so dear to Akeley's heart will be one of the resplendent gems of the Colonial Crown which Belgium owes to her great and far-sighted sovereign, Leopold II.

Immediately upon receiving the sad news of Akeley's death, I cabled to my Government requesting that through telegraphic instructions to our agents in Africa, every aid and comfort be extended to Mrs. Akeley and that all possible facilities be accorded her for her return to America, or to enable her, if she should so desire, to continue the supervision of the work in which her husband was engaged. In response I have received a cable assuring me that the proper instructions have been despatched to Africa and that every-

thing will be done to carry out Mrs. Akeley's wishes in whatever she may wish to do. I know our officials in Belgium and in Africa will do everything in their power to aid Mrs. Akeley and to show their appreciation of the great work Akeley had achieved for the Belgian Congo and in which he had the devoted assistance of his wife, herself a distinguished explorer.

Akeley died on the slopes of Mount Mikeno in the Belgian Congo in the midst of the "Sanctuary" which he had planned and which was the realization of one of his fondest dreams. His death was that of a happy warrior who dies on the field of duty in the struggle for the betterment of the world. Although he was not spared to see the full realization of all his ideals, he knew that the victory was won. As he himself once said: "The slowest and most laborious stages of preparation are now past; the future will show concrete results."

He laid down his life in a great work, not only for his fellow men but for all his fellow creatures. When he closed his eyes on Mount Mikeno, he must have had the supreme satisfaction of knowing that he had achieved success for his cherished ideals, and that the work he had accomplished would be an enduring benefit to the whole world.

What Akeley has done will leave a lasting mark on the activities with which he was associated. His achievements in the realm of science and in the domain of art, his work for the conservation of animal life, will live after him, and will be to him a monument more enduring than any that could be raised by the hand of man. His memory will ever be in our hearts and will be an inspiration to those who come after him to carry on the work to which he devoted his courageous life and to fulfill the high ideals which he has set before us.



Theodore Roosevelt and Kermit on the Uasin Gishu Plateau with the old cow elephant for Akeley's group at the American Museum of Natural History

Akeley, the Explorer

BY KERMIT ROOSEVELT

CARL AKELEY lies at rest on Mount Mikeno; we sorrow at his loss but almost everyone of us will say, "When the time comes, what fitter end? What explorer could ask for better?"

Akeley's was a well-rounded life, and one of great and varied achievements. It has left his name in varied branches of effort; some of them are in fields where there is no limit to what may be yet achieved. In art and invention this is so, but in exploring as we now know it, there is a very definite limit, and it is fast being reached. The great waste spaces in the world become yearly more easy of access. The blank places on the map, across which were written that mysterious and enticing word "unexplored," each year grow less, and until we find access to new worlds, these blank spaces cannot be replaced. Today there remain unknown but a few stretches in South America and in Asia, as well as areas in the arctic and subarctic regions, which are yielding to the type of effort put forth by Byrd and Amundsen and Ellsworth.

When Carl Akeley was born, Africa was still the "Dark Continent." Vast tracts of it were totally unknown, and much of what was known was still a frontier country. The call was irresistible and Akeley followed. Many years of his life he spent in Africa. It seems a long time ago,—as a matter of fact it is now eighteen years,—since my father and Akeley collected for this Museum the group of elephants which stands in the entrance to the great African Hall.

I remember that day on the Uasin Gishu well,—a fair, fresh morning on the African highlands. We soon struck the trail of a herd of elephants which Father and I had seen the previous day. For ten miles we tracked them, up hill and down, through bamboo forests and mimosa jungles, and when we caught up with the massive beasts, and the shooting began, we nearly came in for a first-rate charge at twenty-five yards.

Akeley in New York looked as if he belonged in the jungle; and in the jungle he was an integral part of his surroundings. Lightly built, but powerful and sinewy; the slight stoop only increased the hint of latent force; keen and straightforward of feature; alert and intelligent; and endowed with a ready humor. Akeley was the beau ideal of the naturalist explorer.

His interest in the conservation of wild life eventually centered itself upon the preservation of the gorilla; an animal that would soon fall before the advance of man into his habitat; and one cannot but feel how fitting it is that Akeley should have his last resting place in the sanctuary which he was so instrumental in establishing.

In paying this small and inadequate tribute to Carl Akeley dead, I would not wish to close without a word to Mrs. Akeley living. Bravely she has gone on to complete the task which he had so nearly finished. What her devotion to his ideals must cost her, we can but inadequately estimate, but our feeling of sympathetic admiration could not be more deep and sincere.

NANDI SPEARMEN FACING THE CHARGE OF THE LIONS



Akeley, the Sculptor

By JAMES EARLE FRASER

AKELEY was a recognized sculptor and a member of the National Sculpture Society. Naturally with his many other achievements he had not the time to devote to this work that he wished, and it is amazing that he should have been able in that limited time to arrive at such a mastery of so difficult an art. Many of you know of his various pieces of sculpture, most of them devoted to animal subjects. One of them which is outstanding in my mind is the wounded elephant protected and helped out of danger by his companions, entitled "The Wounded Comrade." This group is massed and designed so beautifully and is so perfect in its feeling that it would be a worthy group for a Fremit or a Bayre. Rarely did either of these great artists convey more of the note of wildness than is in Akeley's work. His animals are alert, fearful, and disturbing.

Many other groups are as interestingly modeled and felt; for instance: "At Bay"; "Stung"; "The Lion and the Buffalo"; "The Charging Herd."

"The Chant of African Natives Over a Slain Lion," is most impressive and dramatic. His group of life-size lions is a powerful piece of action and none but an artist and one who had sculp-

tural instinct could pose and group the animal subjects of his taxidermy which are shown in this Museum and in the Field Museum of Chicago. To have done this work not only must he have been a sculptor but one who had studied animals in the wild state rather than those caged or confined in parks. These groups are invaluable from this standpoint and different from any other museum groups I have seen.

Mr. Akeley's study of the animal in its natural surroundings made him eminently fitted as an animal sculptor, but he also had a monumental feeling toward the art. I had hoped some day his colossal monument to Roosevelt would be accomplished and placed in a proper setting. It would have been profoundly impressive. It was not the ordinary conception and it covered much of the life of the man it was to honor. Its scale was enormous, the lion which was the central figure being forty feet long with surrounding architecture of great proportions. It is unfortunate that America has not this unusual monument to her great President. Perhaps it may yet be realized. Had this monument been carried to completion it is likely that Carl Akeley would have been admittedly greater in sculpture than in any other field of his achievements.



THE CHARGING LIONS



THE REQUIEM



Akeley, the Inventor

By F. TRUBEE DAVISON

GENIUS is very rare, and because of its nature, there is no absolute or even relative standard by which it can be determined. But frequently we find it generously bestowed by contemporaries only to find that it is repudiated by posterity. Because of this fact, it seems to me that when we undertake to ascribe genius to anybody, we should do so with hesitation and with conservatism. I think that all who knew Akeley intimately, who knew of his work, would unite in saying that he certainly had a touch of genius.

History describes a goodly number of individuals who stood out above their fellow men for one reason or another, and the gifts which have brought this distinction have generally been confined to a comparatively limited though important field of human activity. It is very seldom that an unusual capacity in diverse ways is to be found in one man.

Akeley certainly filled a unique place in modern American life. His point of view, his method of attack, were strictly scientific; his practical mechanical resourcefulness was almost uncanny. These qualities he possessed to a rare degree, but further than that, he united with them the conception and the execution of the artist. With these natural qualities, stimulated by a superb character, is it any wonder that his works are so important and so unique?

It is also difficult to attempt to analyze the characteristics of a friend, and it certainly would be futile to do so in this case. I do think that when we are reflecting upon Akeley's work as an inventor, it would be impossible to

appreciate it to the full without recalling one characteristic that was to me his outstanding one, and that was the unequivocal desire to ascertain the truth, and to pass it on to his fellow men.

Those who knew him intimately and worked with him and loved him, could not fail to be conscious, and fully conscious, of that characteristic. I remember very well sitting with him one day at the Club after luncheon. We were discussing the African Hall. He was telling me of the projected expedition to Africa to obtain the groups which were to fill that great hall. I asked him about the specimens that were already available, but that had not yet been mounted. He told me about a compromise that had been suggested in order to overcome the shortage of a bull member of an antelope group, by placing together the skins of two females, and in that way make the whole into a possible resemblance of the male, the falseness of which, it was suggested, none but an expert might detect. I have never heard any human being flayed as was the individual who made that suggestion. Akeley would far rather have quit his profession than to have adopted what was to him a dishonorable subterfuge.

He was, of course, primarily a naturalist, and his interest lay chiefly, as we all know, in the mammal life of Africa. His love for it, his complete belief in its beauty, his desire to have it known as it is and not as the sensationalist would like to have it, his anxiety to record the existing wild life before it became a story of the

past, all combined together to make his chief aim that of telling his fellow country men the truth about that continent. And it was toward this goal that he was always plodding, often under real discouragements, but always hopeful for the future.

Certainly during the past year and one-half, this great ambition seemed to be more nearly within his grasp. We know that on this final trip his faith was not unjustified, and it seems to me that it remains for us to see to it that it is realized.

In carrying out his purposes, his extraordinary bent as an inventor put him in a position to devise new ways and means of overcoming difficulties. This life work, together with the temporary needs of his country during the war, was primarily responsible for the mechanical developments that must be attributed to him. The national emergency offered a new but temporary field for his inventive genius and it proved to be a very fruitful one.

His inventions fall roughly into four different groups; the development of the cement gun, the war inventions, the motion-picture camera, and his extraordinary method of taxidermy which has completely revolutionized that art.

The circumstances surrounding the invention of the cement gun are rather curious, and while they have no direct bearing on his work at the Field Museum at Chicago, still it might never have been produced had he not been there.

When he returned from Africa to the Museum, in 1905, it was located in the old Columbian Exposition Building which was made of stucco. The outside of the building was constantly peeling off. This gave it a very disreputable appearance. Akeley, of

course, was loyal to that institution and wanted to do everything within his power to preserve its dignity. When this condition was brought to his attention, he put his resourceful mind to work to seek a remedy. To use his own words: "I got to thinking about it, and in the many experiments of one kind and another that I had tried in working out methods of manikin-making, I had among other things used a compressed air spray, so I thought it would be possible to make an apparatus that would spray a liquid concrete on the side of a building, and it worked." The result was that some friends financed the manufacture of the air-spray, and today it has a very large and important commercial use.

Furthermore, it was one of the hundreds of inventions that were used by the government during the war, for the gun proved invaluable in the building of concrete ships.

When the call to arms came in 1917, Akeley, of course, was too old to be an active soldier in the field, but with his special training and unusual abilities, he found many ways of doing his bit. The Akeley camera, about which I shall speak more in detail, proved to be the one that would fill the need of the army, and the output of the factory was contracted for by the Government. Akeley was also made a Consulting Engineer, Division of Investigation and Research Development of the Engineers Department in the Army, and in addition to that, a Special Assistant to the Chief of the Concrete Ship Division in the Emergency Fleet Corporation.

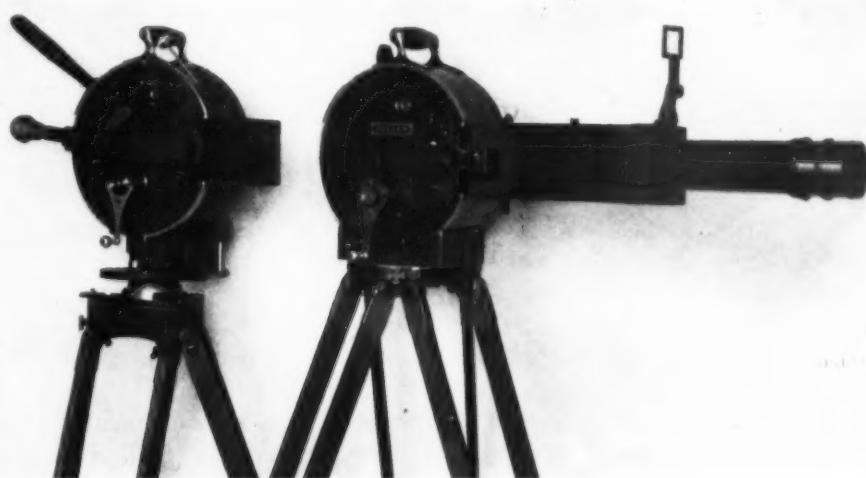
His activities were not centered in Washington; and as you can imagine, he did all he could to stay away from there. His time was spent in the laboratory and in the shop. We can



The first model of the Akeley Camera, which was patented in 1916

well imagine that his usefulness in these various capacities was valuable, and the records show that he was remarkably helpful in developing, for instance, searchlights and searchlight mirrors of rotary control, enabling the

sought every method conceivable to translate accurately to them what he saw with his trained eye, and in this mechanical age he was quick to grasp the possibilities of the motion-picture camera.



Mr. Akeley's two cameras, —a standard "Akeley" and the "Gorilla" camera—also an Akeley—especially fitted with a telephoto lens

operator to direct the rays of light toward any object in the sky and follow up its movements. The records further show that several other devices were patented by the Government under his name during the war period. This ends the very inadequate story of his very full wartime activities in so far as the activities themselves are concerned. The seeds that he sowed then are still bearing fruit and will continue to do so.

There are all kinds of scientists, but Akeley was not one of those who was simply interested in the philosophy of his subject. He was not content to enjoy its fascinations and let it go at that. He had a larger vision, and wanted to make those things which were wonderful and inspiring to him equally so to his fellow men. He

One of his expeditions, as many of you will recall, was in 1909. He went to Africa then primarily to obtain moving pictures of the Nandi spearing lions. He found that the motion-picture camera of that day had made great progress, but that there was none in existence which would enable the man in the field, as contrasted with the operator in the studio, to record speedily and accurately fast moving events which were taking place in unexpected quarters. The ordinary moving picture director has control over his subjects, but the man who is taking pictures of wild life in the fields finds it a very difficult problem; his subjects are not interested in his problem, and in fact, as anyone who has tried will know, they seem to do everything possible to conspire against it.

That Akeley learned, and learned well, during the trip of 1909. He determined to do what he could to devise and to build a camera which would overcome those obstacles. The result was the camera which is now known the world over as the Akeley Camera. It required years of study and work, and today it stands a living monument to its inventor, one who produced it with his own mind and with his own hands, not for profit, but to enable him and others to tell the truth more accurately to those millions of people who did not have the same opportunities that he had. It is today unquestionably one of the greatest instruments of its kind in existence, and for the particular purpose for which it was designed it has no equal. It is found in the studio, in the home, on the athletic field, and in the most remote corners of the earth, the peaks of the Himalayas, the South Seas, the Arctic circles. It has provided a fascinating textbook for countless numbers of men, women, and children, and very particularly the children. Furthermore, as I mentioned, the Government of the United States found it important for its use in war and is continuing to do so in peace.

Akeley was generally considered as being chiefly associated with museum work. That was his principal life, of course, and in it he saw the medium by which he could realize his ambitions. He was born in the rural sections of New York State, and while he was still very much of a youngster, he came under the influence of an Englishman named Bruce, whose hobby was taxidermy. Soon afterward, as Akeley himself said, "I announced to the whole world that I was a taxidermist." The hope that he might become associated with Wards Natural Science Establishment, so-

called, in Rochester, led him to travel to that city in search of employment. That was forthcoming and the foundation was laid for a very distinguished career in that profession.

It didn't take long, however, for his overpowering instinct for the truth to assert itself, and certainly the methods of taxidermy of that day fell far short of the ideal. They consisted, as Akeley described them, "of first treating the skin, then wiring and wrapping the bones, which were inserted in the legs of the animal while the body was hung upside down and stuffed with straw until it would hold no more."

The problem was not so much the crudeness of the method of the procedure that rankled in Akeley's mind, as the fact that the finished product was absolutely unreal and could not be expected to give a real impression of the mammal it was designed to represent. So Akeley set his inventive mind to work, with the result that he revolutionized the technique of that profession, and brought in accuracy, beauty, and realism, which carry with them the mystery and romance of wild life.

This development was worked out over a period of four years while Akeley was working at the Field Museum in Chicago, although the preliminaries were accomplished prior to that time while in Milwaukee. His first big groups (and many of us have had the privilege of seeing them) are the four seasons; the groups of American deer which are now located in the Field Museum. They are among the most beautiful and significant groups in that institution today, and stand as a lasting tribute to Akeley's early genius and work.

They are but the first of a long series, and their creation marks a fundamental milepost in improved facilities for

bringing nature to the millions who are not fortunate enough to be able to penetrate the wilds.

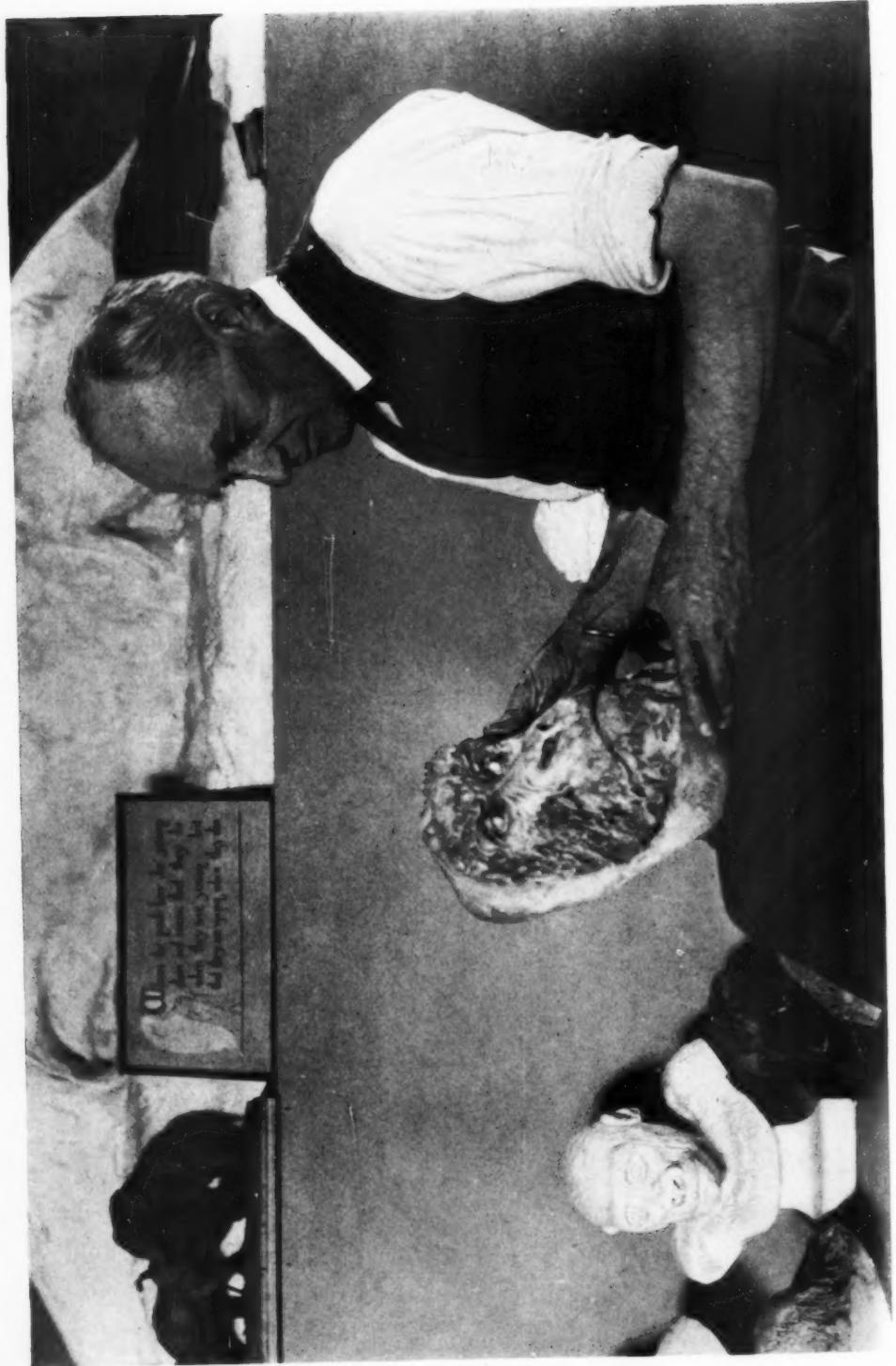
This new method has become the standard by which taxidermy is measured today. There is no stuffing, and no hanging together with wires; the sculptor rather is given an opportunity to reproduce his model down to the very last muscle, and the animal when completed is lifelike, light, durable, and will last for an indefinite time in a setting which is an exact reproduction of its habitat.

The African Hall was the great goal toward which he was working; all else

was preparatory. Therein he visualized some forty groups of African mammals, realistic and picturesque, the backgrounds painted by a competent artist on the scene itself, with bushes, trees, and other natural flora scientifically made or else preserved to give a complete and detailed story. The work is begun, and begun in a manner that only Akeley could have conceived. It must be completed, and it must be completed in the Akeley way. His was a great soul, a great character; his was a great vision, and his inventive genius has provided the tools to make that vision a reality.



Akeley cement guns in action



THINKING ABOUT THE GORILLA
Taken in 1925, shortly after Mr. Akeley's return from the Gorilla Expedition

Akeley, the Man

By GEORGE H. SHERWOOD

CARL AKELY was a *self-made* man in the fullest meaning of the word, and attained his eminent position in the world through his own efforts by dint of hard, painstaking work and an unshakable faith in his ideals. His entire career was one continuous struggle in the face of many obstacles, insurmountable except for his indomitable will.

He was born sixty-two years ago on a little farm in western New York. Because of poverty his schooling was limited to two years in the State Normal School. In his autobiography he says that by all the rules of the game he should have been a farmer, but that for some reason he was more interested in the birds and chipmunks than in crops and cattle. When about thirteen years of age, he obtained a book on taxidermy, which he eagerly studied. His imagination was fired with a burning desire to give a true representation of the birds and other animals around him, and taxidermy became his ambition. He even took some lessons in painting in order that he might paint realistic backgrounds for his stuffed birds—probably the first experiments with painted backgrounds for taxidermic groups. This was the beginning of modern taxidermy, which he more than anyone else has raised from a mere trade to a real art.

At the age of nineteen, desiring a wider field for his ambition, Akeley quit the farm and obtained employment in Wards Natural Science Establishment at Rochester. Here he learned what might be called the "upholstery" method of taxidermy. He wanted to try out his original ideas for mounting

animals, but his efforts were frowned upon because of costs.

From Rochester Akeley went to the Milwaukee Museum. Here he found an opportunity to put some of his ideas into effect in spite of the opposition of the authorities, and he mounted his first group—a Laplander Driving his Reindeer over the Snow. This led to his proposing other groups, but his plans were tolerated rather than encouraged, until his friend William Morton Wheeler became director of the Museum. This marked the beginning of the Akeley method of taxidermy, which has revolutionized the art and stands as Akeley's greatest contribution to museum development.

In 1895 Akeley was called to the Field Museum in Chicago, where he remained fourteen years. This period witnessed the establishment and perfection of his method of taxidermy, which resulted in the splendid series of groups now in that museum. His first trip to Africa in 1896 with Daniel G. Elliot gave birth to that love of Africa which dominated his life to the end.

In 1909 Akeley joined the staff of the American Museum of Natural History and continued in its service until his death. It was while he was collecting his superb elephant group for the Museum that he first conceived the project of a great African Hall, which should stand as a permanent record of the fast disappearing wild life of Africa. For twelve years he labored toward this goal, with many discouragements, until the last African expedition was made possible through the generosity of Messrs. George Eastman,

Daniel Pomeroy, and Colonel Wentz.

It was in this hard school of experience that Carl Akeley was trained and developed into the many-sided genius to whom today we pay our tribute of honor, admiration, and affection. Great, however, as are his achievements as nature lover, explorer, conservationist, sculptor, and inventor, it is the loss of Akeley the man that overwhelms us.

His was a rugged, virile personality, tempered by a deep sentiment and a whimsical humor which endeared him to his friends. He was a clean, hard-hitting fighter, who won our admiration for his fearlessness in defense of his convictions, whether we agreed with him or not. At times there was a steely glint in his eyes, but this denoted determination—not venom, for he always was a generous adversary. He possessed a tenderness of heart and a hatred of cruelty which made him an outspoken champion of all wild life but free from any maudlin sentimentality. He had a depth of character which held him to his ideals and would brook no compromise with expediency. His devotion to these standards often meant great personal self-sacrifice, from which he never shrank.

Those fine traits of character which guided Akeley in his untiring efforts to attain perfection in his own work made him a loyal and dependable friend. It was indeed a real privilege to know him intimately. Among my most cherished memories will live those moments which witnessed a new creation from his fertile brain. When his hero and idol, Colonel Roosevelt, died, Akeley, was broken-hearted and was quite incapable of working. A few days after the funeral he summoned me to his studio. As I entered I saw in

rough clay a sketch of the world, surmounted by a majestic lion, in which were expressed dignity, strength, courage, fearlessness. This was his first conception of the Roosevelt Lion and, as he with deep emotion explained to me its purpose, never shall I forget the joy that beamed from his face because he had found a means of expressing his love for his dear friend.

The great charm of Akeley's personality was a sweetness and gentleness of nature, accompanied by a sympathetic understanding which led both old and young to seek his advice and counsel. Never was he too occupied with his own affairs to be interested in yours. There was a subtle indefinable something in Akeley which enabled him unconsciously to impart to those around him something of his enthusiasm, something of his idealism and something of his determination to achieve, which inspired them with new courage, new hope, and greater effort. A few days ago I received a letter from a successful business friend in the west. He wrote, "Whatever there is in me of decency and worth-whileness I owe to Akeley more than to any other man in the world."

I believe that the greatest *invisible* monument to his memory is the gratitude in the hearts of a host of friends who have thus profited by their contact with him.

His love for his fellow man, his keen appreciation of the works of nature, his joy in expressing his creative impulses gave to him perpetual youth of thought. Over his desk hangs this appropriate motto: "Whom the gods love die young does not mean that they die when they are young, but that they are *young* when they die." So it was with Akeley, the Man. All honor to him.

Carl Akeley's Early Work and Environment

BY WILLIAM MORTON WHEELER

THE mature constructive activities of an unusual man whose fame becomes established during his lifetime are apt to be so widely known that they can be readily reported and appraised, but it is more difficult to evaluate the long years of struggle and preparation that necessarily precede the successful climax of such a career. This is eminently true of Carl Akeley, whose greatest achievement lay in his revolution of taxidermy, an art of obscure origin and long and gradual development in esoteric museum laboratories to which, for obvious reasons, the general public is not welcomed. The critical period in Akeley's life extended from the beginning of 1884 to the end of 1890, and as I was privileged to be his bosom friend and almost constant companion during that period, I gladly comply with Doctor Lucas' request to contribute to this memorial number of NATURAL HISTORY. And since, moreover, I happened to have kept a voluminous diary covering those years, I can precisely date most of my statements. If, in what follows, my own personality obtrudes too conspicuously, I beg the reader's indulgence for two reasons: first, because we were so intimate that I was necessarily an active, daily element in Akeley's biological and social environment, and second, because as I peruse my diaries for the first time since they were composed with all the effusive detail of youth, my present contracted ego seems to belong to quite a different person.

I was born in 1865 in Milwaukee and lived there till I was nearly nineteen.

The cerevisiacal fame which that city enjoyed in those preprohibition days unfortunately quite eclipsed the fame of its temperate and highly intellectual German population and excellent school system.

Owing to my persistently bad behavior soon after I entered the public school my father transferred me to a German academy founded by Peter Engelmann, an able pedagogue who had immigrated to the Middle West in 1848. The school had a deserved reputation for extreme severity of discipline. To have annoyed one of the burly Ph.D.'s, who acted as my instructors, as I had annoyed the demure little schoolmarm in the ward school, would probably have meant maiming for life at his hands or flaying alive by the huge Jewish director, Dr. Isidore Keller, "curled and oiled like an Assyrian bull."

After completing the courses in the academy, I attended a German normal school which somehow had come to be appended to the institution. A few weeks before my father's death in January, 1884, an incident occurred which was to influence my whole subsequent life and indirectly Carl Akeley's. Prof. H. A. Ward, proprietor of Ward's Natural Science Establishment in Rochester, New York, which was not so much a museum as a museum factory, learned that there was to be an exposition in Milwaukee in the fall of 1883 and that the local German academy, which I had attended, possessed a small museum. He decided, therefore, to bring a collection of stuffed and skeletonized mammals, birds, and reptiles, and an



CARL AKELEY

From a photograph taken in 1888, shortly after Akeley went to the Milwaukee Museum

attractive series of marine invertebrates to the exposition, and to persuade the city fathers to purchase the lot, combine it with the academy's collection, and thus lay the foundation for a free municipal museum of natural history. I had haunted the old academy museum since childhood and knew every specimen in it. Indeed, Dr. H. Dorner, my instructor in natural science, had often permitted me to act as his assistant. Of course, I was on hand when Professor Ward's boxes arrived, and I still remember the delightful thrill with which I gazed on the entrancing specimens that seemed to have come from some other planet. I at once volunteered to spend my nights in helping Professor Ward unpack and install the specimens, and I worked as only an enthusiastic youth can work. He seems to have been duly impressed by my industry, because he offered me a job in his establishment. I was quite carried away with the prospect of passing my days among the wonderful beasts in Rochester. Not the least of Professor Ward's attainments were his uncanny insight into human nature and his grim business and scientific acumen. He offered me the princely salary of nine dollars a week, six of which were to be deducted for board and lodging in his own house.

I entered Ward's Establishment February 7, 1884. My duties consisted in identifying, with the aid of a fair library, and listing birds and mammals. Later I was made a foreman and devoted most of my time to identifying and arranging the collections of shells, echinoderms, and sponges, and preparing catalogues and price lists of them for publication. Such is the present state of conchology that my shell-catalogue is still used by collectors. At this time Akeley entered the establish-

ment as a budding taxidermist, and for once Professor Ward's estimate of human nature seems to have been at fault, for as Akeley informs us in *In Brightest Africa*, he was given a salary of \$3.50 a week, without board and lodging. He attached himself to William Critchley, a young and enthusiastic artisan, with the voice and physique of an Italian opera tenor, who had attained the highest proficiency in the taxidermic methods of the time, but did not seem to give promise of advancing the art. In the course of a year Akeley had more than mastered all that Critchley could teach him, and was longing for wider opportunities than could be offered by an establishment, which, after all, was neither an art school nor a scientific laboratory, but a business venture. But even so, there is reason to believe that its standards of workmanship were higher than in any of the museums that had grown up in various parts of the country.¹

The relations between Akeley and myself soon ripened into a warm friendship. We were nearly of the same physical age, but I was the younger and more unsettled mentally, for he had been reared by sturdy parents on a quiet farm and I had been brought up in a bustling city with a superheated atmosphere of German Kultur. He was very strong and healthy, had an inexhaustible capacity for work, a great fund of quiet humor, and a thoroughly manly disposition. He seemed to have been born with unusual taste and discrimination and an intuition which could dispense with mere book-learning. Of all the men I have known—and my profession has brought me into contact with a great many—he seems to me to have had the greatest range of innate ability. Although he

¹Save in the United States National Museum.

later became an unusual sculptor, inventor, and explorer, he would probably have been equally successful in any other career.

In the course of time our relations settled into those of affectionate older and younger brothers. I cannot recall that we were ever even on the verge of a quarrel, and this must have been due to Akeley's self-restraint and sympathetic tolerance, because I was often irritable and unwell in those days. Owing to the fact that we did not work in the same building, our companionship was largely limited to evenings and Sundays. As I read the diaries of 1884 and 1885 I marvel at the multiplicity of our youthful interests and occupations. I cite a few passages to illustrate how we spent some of our spare hours.

"MONDAY, Jan. 6, 1885. Worked on the glossary for the shell-catalogue all day. In the evening went with Carl to hear Bob Ingersoll in his lecture "Which Way?" We were much pleased with him and his wit. The lecture cleared from my mind a host of prejudices against this man who is after all a *real he man*. Weather cold."

"SUNDAY, Feb. 15, 1885. Rose late. Took a walk with Carl and then went to church (Unitarian) with him to hear Doctor Mann give a magnificent sermon on the text "Out of Egypt will I call my son." Worked on algebra and read Virgil after dinner. Then walked down West Ave. with Fritz Mueller [a former schoolmate whom I was coaching in Latin for entrance to Johns Hopkins. He was the living image of the famous physiologist Johannes Mueller and probably belonged to the same family]. Tired on my return. Fritz read to me Jean Paul Friedrich Richter's 'Kampaner Thal.'"

"THURSDAY, Feb. 26, 1885. Worked on the shell-catalogue more diligently

than on previous days, but am still low-spirited. In the evening read the conclusion of the *Aeneid* and some of Zeller's "Deutches Reich" with Louis Akeley [Carl's brother who was attending the University of Rochester and whom I was coaching in German]. To bed at a quarter of twelve."

"MONDAY, March 23, 1885. Worked all day on the foetal Marsupials: kangaroos, koalas, opossums, etc. Labelled all the foetuses and pouches. In the evening walked with Fritz and on returning read with him about 100 lines of the third book of the *Aeneid*. The evening ended with an acrimonious dispute and I went to bed in high dudgeon."

"THURSDAY, March 24, 1885. Worked all day in Prevotel's shop, changing and labelling the alcoholic fishes. In the evening attended the meeting of the Geological Section of the Rochester Academy of Sciences. Mr. Preston read to us about a quarter of Geikie's "Primer of Geology." After the meeting walked with Mr. Shelley Crump [an amateur conchologist and prosperous grocer of Pittsford, New York, to whom I had become greatly attached]. To bed at eleven."

And this is an account of a week-end with Mr. Crump:

"SUNDAY, May 23, 1885. From 10 to 12 worked with Professor Ward in the shell-house, labelling Echini—the last time I saw him [for many years]. In the afternoon Mr. Crump and his friend Doctor Dunning called on me. I walked with them to Brighton and thence took the train to Pittsford. We read together some recent papers on Pasteur by Tyndall and others and then walked along the Erie Canal bank where I collected two species of *Valvata*."

"MONDAY, May 4, 1885. Rose late. Read some of Burrough's 'Wake

Robin' before breakfast. Then conversed with Dr. Dunning on Shakespeare's 'Sonnets' [Dr. D. was blind and with the aid of his wife was preparing a volume on the sonnets]. At 9:20 took the train for Rochester and went to work in the shell-house, finishing the family Nassidæ and part of the Volutidæ."

"TUESDAY, June 23, 1885. In the morning read Bluntschli with Louis Akeley. In the afternoon went with Carl, Will Critchley, and Mr. Crump to see the tobacconist Kimball's beautiful collection of orchids. Succeeded in making a Catasetum discharge its pollinia! In the evening read Bluntschli again after having seen Mr. Crump off on the West Shore train. Returned much fatigued. My eyes begin to pain me."

Of active, industrious young men there seem to be two types. One of them accepts a given environment and is not only satisfied with its routine and constantly recurring human contacts but prefers it to any change. These young men are apt to marry early and to become the conservative and contented *fond* of our society. Those of the other type, probably endowed with a more unstable if not more vivid imagination and with a peculiar defence reaction, or subconscious dread of being owned by people and things, soon exhaust the possibilities of their medium, like fungi that burn out their substratum, and become dissatisfied and restless till they can implant themselves in fresh conditions of growth. Akeley and I were of this latter type, and by the spring of 1885 had decided to leave the establishment at the earliest opportunity. I departed June 29 and returned to Milwaukee, but Akeley remained, apparently because the death of the elephant Jumbo, which

was to be mounted for Tuft's College, recently founded by Barnum, had just presented an opportunity for a new kind of taxidermic exploit. He and Critchley were put on the job, but Akeley naturally became the dominant member of the partnership and was soon absorbed in the problems of large mammal taxidermy which were to occupy him for so many years. His superb neuromuscular organization seemed to have been specially designed to give plastic expression to the refractory hide of the huge quadruped, and the successful accomplishment of the task furnished the inspiration for his later work in Africa, the Field Museum, and the American Museum.

Soon after my return to Milwaukee my old friend, Dr. George W. Peckham, who had long been making important contributions to arachnology and was beginning his well-known studies on the behavior of the solitary and social wasps, persuaded me to take a position as teacher of German and physiology in the high school of which he was principal. Peckham was a very learned and charming man, deeply steeped in the evolutionary literature of the time and keenly alive to the possibilities of the new morphology that had been inaugurated by Huxley in England and a host of remarkable investigators in the laboratories of the German universities. Every year he most conscientiously read, as a devout priest might read his breviary, Darwin's *Origin and Animals and Plants under Domestication*. We became very intimate, and I find from my diaries that for some years I regularly spent my Sunday mornings in his house drawing the palpi and epigyna of spiders to illustrate the papers which he wrote in collaboration with his equally gifted and charming wife. I was privileged to

collaborate with them in one paper (on the *Lyssomanæ*) and to help them during the summers in their field work on the wasps at Pine Lake, Wisconsin. Under Peckham's management the biological work of the Milwaukee high school was carried far beyond that of any similar institution in the country. There were classes in embryology, with Foster as a text. We possessed a Jung microtome and the paraphernalia for staining sections and demonstrating the development of the chick, and, of course, the classes in physiology were required to master Huxley and Martin. While at Ward's I had purchased Carnoy's *Biologie Cellulaire* and had imbibed from it an intense but rather ineffectual interest in cytology. Then most fortunately, Mr. E. P. Allis established his "Lake Laboratory" in his residence near the high school and appointed Prof. C. O. Whitman as its director and Dr. William Patten, Dr. Howard Ayres, and Mr. A. C. Eycleshymer as assistants. These gentlemen were, of course, actively spreading the gospel of the new morphology. Doctor Patten, only four years my senior and fresh from Leuckart's laboratory in Leipzig, taught me the latest embryological technique and suggested that I take up the embryology of *Blatta* and other insects. I find that I devoted nearly all my spare time to this work till 1890.

In the meantime the Milwaukee Public Museum had been established according to the plan suggested by Professor Ward, and I saw an opening for Akeley as its taxidermist. I persuaded him to come to Milwaukee and live with me. He arrived November 8, 1886, and although he was not officially appointed to the institution till November 20, 1888, he was given a certain amount of its work. We con-

verted a barn on my mother's place into a shop and here he worked at least during the evenings for several years. I was made custodian of the museum September 19, 1887, and held the position till August 29, 1890. By that time my association with Peckham, Whitman, and Patten had converted me into a hard-boiled morphologist, and I was induced by Whitman to accept a fellowship at Clark University, where he had become professor of zoölogy a year earlier. Till October 1, 1890, when I left Milwaukee for good, Akeley and I had spent so many happy hours together that the parting was painful. After leaving the high school I had fitted up a laboratory in the house and when my eyes grew weary with the microscope I repaired to his shop and read to him while he worked or more rarely he read to me. My diary mentions the volumes we read and I wonder at Akeley's patience and apparent pleasure in listening to Bryce's *American Commonwealth*, translations of Æschylus, Max Nordau, and similar high-brow stuff. I patiently read a whole small library for at that time I had serious conscientious objections to beginning a book without reading its every word. Perhaps Akeley really heard only occasional important fragments and had found that he could carry on his own trains of inventive thought better when we were together and I was making a continual but not too disturbing noise.

After we separated in the fall of 1890 I was to see Akeley only at long intervals. I had hoped to be able to provide him at the museum with every opportunity for his work, but the city's appropriations were small, and we were unable to undertake the mounting of the elaborate groups which he was constantly building in his artistic imagina-







SPRING.
This and the following three groups of Virginia deer representing "The Four Seasons" were placed on exhibition in the Field Museum of Natural History in 1902. Courtesy of the Field Museum of Natural History

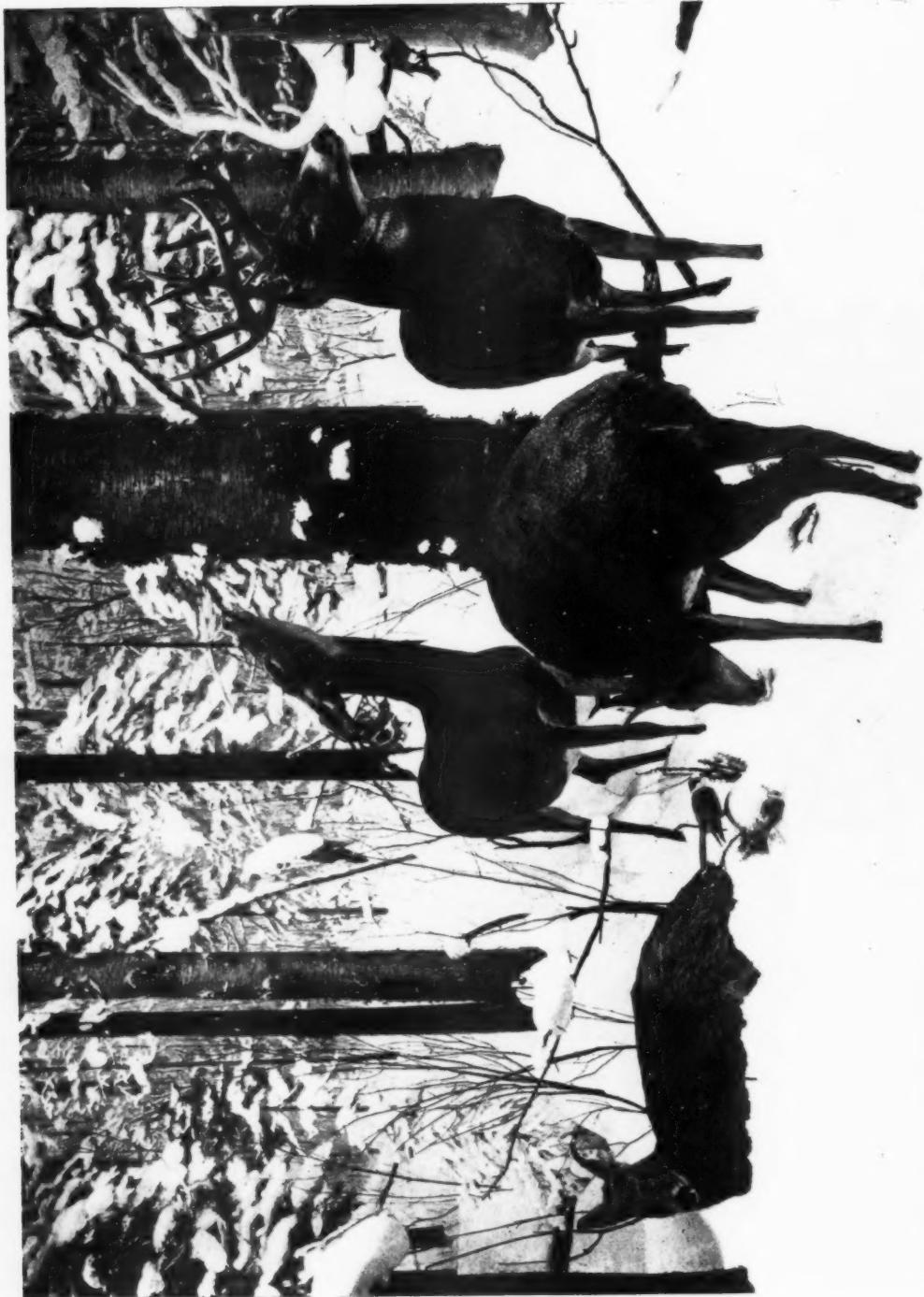
SUMMER



AUTUMN



WINTER



WINTER



tion. He was able to develop his technique on a small scale, however, so that when the opportunity came some years later at the Field Museum, he had no difficulty in creating his fine groups representing the four seasons of the Virginia deer, and was fully equipped to undertake his African groups as soon as he could secure the necessary specimens and data on their habits and habitats. I feel certain, therefore, that the eight years he spent in the quiet and sympathetic Milwaukee environment where he led a secluded, abstemious life, and worked twelve to fourteen hours a day, were the most important period of his development both as a taxidermist and as a sculptor.

It appears that I was also the cause of his leaving Milwaukee. While on my way in 1893 to work in Boveri's laboratory in Würzburg, I visited the British Museum of Natural History, and was conducted through it by its director, Sir William Flower. After viewing some of the taxidermic atrocities exhibited in that Elysium of glass cases, I remarked that we had in America the most accomplished young taxidermist in existence. Most Englishmen would have dismissed this as a mere piece of Yankee boasting, but there must have been something in my voice or manner that arrested Sir William's attention, since he asked for Akeley's name and address and, as I later learned, requested him to come to London. But while he was passing through Chicago on his way to the British Museum, Akeley visited the Field Museum and was intercepted and engaged by its curator of zoölogy, Dr. D. G. Elliot.

In 1894, soon after returning to the University of Chicago where I was then instructor in embryology with Professor Whitman, I learned that Akeley was at

the Field Museum. I naturally looked forward to a renewal of our old intimacy but was informed that this was impossible. It seems that Professor Elliot, whom I had never met, disliked the zoölogical department of the university, probably because of its strong morphological bias and the outspoken contempt of a few of its members for taxonomy, and I was naturally included as a *persona ingrata*. Moreover, he realized that he had captured a prize in Carl Akeley and was afraid that the secrets of his technique might leak out and be appropriated by some other museum. He therefore forbade any visits and kept Akeley closely confined, and as he worked every day and far into every night, I was able to see him only once or twice during all the years I was still to remain in Chicago. Professor Elliot's procedure was not devoid of humor, because I was, of course, perfectly familiar with Akeley's methods and could have made no use of them even had I wished to do so. Many years later fate brought an ironical atonement when the National Academy of Sciences conferred on me a medal which had been established by this same Professor Elliot!

To appreciate fully the educational and aesthetic significance of Akeley's work would require a serious review of the history of taxidermy, and this unfortunately has never been made the subject of careful investigation. As a means of preserving domestic pets and the trophies of the chase the art may be ancient, but could have had little importance till extensive natural history cabinets were established in Europe during the seventeenth and eighteenth centuries. Of the first work on taxidermy, written by Réaumur¹ no copy

¹Mémoires sur la préparation des objets d'histoire naturelle, 1745.

has been found, but it may exist wholly or in part in English translation as an article in the *Philosophical Transactions of the Royal Society*.¹ I have found in the library of the American Museum a publication containing a number of Réaumur's letters,² in some of which, addressed to J. F. Séguier, one of his correspondents in Italy, he gives directions for treating birds, etc., for shipment to him and describes his method of preparing them for the cabinet. The dead birds were sent packed in kegs with much salt, alum, or wine vinegar as preservatives, and his method of mounting them consisted in giving them a natural posture and then baking them in an oven till they were quite hard and dry. Another naturalist of the time, a German botanist, simply bisected his birds along the sagittal plane, spread out the two halves and pressed them like plants in his portfolios! Of course the *Dermestes* must have been delighted with collections made according to these wonderful methods, which were really processes of mummification and not taxidermy. Probably mammals, since their skins could be removed more easily than those of birds, were actually stuffed at that time.

The museum curators and their assistants throughout the greater part of the nineteenth century in France, Germany, England and the United States somehow managed to develop taxidermy to the stage in which it was vegetating when Akeley began his work. The duty of the poorly paid curator had always been to amass, hoard, name, describe, and label as many different defunct animals as

¹Divers Means of Preserving from Corruption Dead Birds, Quadrupeds, Reptiles, Fishes and Insects, *Phil. Trans. Roy. Soc.* 45, 1748 (1750) pp. 304-320.

²Edited by G. Musset in the *Ann. Soc. Sc. Nat. Acad. La Rochelle* 21, 1884, pp. 177-258, and 22, 1885, pp. 89-191; reprinted as a volume of 183 pages in 1886.

possible, and the duty of his famulus the even more poorly paid taxidermist, was to impregnate them with lethal chemicals in sufficient quantity to discourage the museum pests and to try to give them a semblance of life. The result was pathetic when it was not ludicrous, because the taxidermist, at least in museums open to the public, was confronted with the stupendous problem of making dead hides thrilling to the common run of humanity, and the curator, if he was a scientist, necessarily pursued the method of all science, namely, that of abstraction, which has never been attractive to the great majority of our species. He was mainly interested in animals in isolation from their natural environment and behavior and reduced to so much fur, feathers, horns, hoofs, bones, etc., which he could measure and describe in an esoteric argon intelligible only to other curators in other museums. Akeley, of course, hugely enjoyed the taxidermic exhibits of those days. I remember walking with him through a certain museum and coming upon a stuffed lynx. The creature had been upholstered to about four times its volume in life, its fur had long been a happy hunting ground for *Dermestes*, and one of its glass eyes had become dislocated, so that it was wall-eyed. Just then a sunbeam stole through the dusty pane of the case and fell on that unfortunate orb. The pathetic but fiery glance which it emitted and which seemed to concentrate within itself the whole tragedy of contemporary taxidermy, threw us both into convulsions of laughter.

From the beginning, Akeley clearly realized that any animal mounted for public exhibition can have neither educational nor æsthetic value merely as a stuffed hide, furnished with a pair

of glass eyes, attached to a turned wooden pedicel, and provided with a label giving its Latin and vernacular names and the name of the locality in which it was slain. He was thoroughly convinced that an animal is meaningless, except to a hard-shelled zoölogist, unless it is presented in such a manner as to convey something of its real character, or *ethos*, which is manifested by its specific motor behavior in a specific natural environment. The development of the taxidermic "group" follows naturally from such a conviction. At the present time, owing largely to Akeley's intensive study of mammalian habits and musculature and his achievements in animal sculpture and the construction of groups, no curator, in the United States at least, would dream of tolerating those indecent, not to say immoral, stuffed beasts which were lined up in the museums of the Victorian age. Furthermore, Akeley's conception was, in a sense, prophetic of a change which through the influence of the ethologists, behaviorists, physiologists and psychologists, has now per-

vaded the whole field of the biological sciences, so that we have come to see that an organism cannot be isolated, even conceptually, from the peculiar environment to which it has become adapted during æons of geologic time, without a serious misunderstanding of its true nature.

In conclusion I feel that I must again apologize for the large amount of autobiographical material in this article. Probably my old comrade would have pardoned this as he condoned so many of my faults. The last time I saw him, before he left for Africa, never to return, he said, "Will, I want you to go to Africa with me so that we may end our careers, as we began them, together." This remark, I believe, was neither a premonition nor an utterance of what has been called the subconscious will to death, but the expression of a desire that we might journey together to some delightful spot in the land he so ardently loved and be reunited in our old age, as we had been united in youth, by our common interest in animal life.





"THE CHALLENGE."—Awarded first prize by Theodore Roosevelt at the first Sportsman's Show, New York, 1895. Owned by Dr. H. M. Beck. By courtesy of Doctor Beck

Akeley as a Taxidermist

A CHAPTER IN THE HISTORY OF MUSEUM METHODS

BY FREDERIC A. LUCAS

Honorary Director, American Museum

IT has fallen to me to write of Akeley as a taxidermist, and while the result is by no means satisfactory to me, I have at least recorded some of the more important contributions he made to methods of museum display: I can only plead that I have written as Providence endowed me and not as I should have liked to have done.

While Akeley was successful as a hunter, an inventor, and a sculptor, yet it is as a taxidermist that he will be

best known and remembered. Taxidermy was Akeley's chosen field; from first to last, from the beginning of his career to its end, he devoted himself to improving taxidermy in every branch, artistic, mechanical, scientific; above all he strove to make its results permanent. If, as we have been told, genius is an infinite capacity for taking pains, Akeley was most emphatically a genius in his taxidermy: every step from field to museum; skinning, shipping, tan-

ning, modeling, constructing the manikin, and clothing it with skin, making the foliage, building the cases, providing them with light and ventilation, each and all bear the impress of the mind and hand of Akeley.

To repeat the words of Mr. Ward, he did more for taxidermy than any other one man, and but for him, museum exhibits would not be what they are today.



In spite of the thousands of words, many of them obsolete and many practically useless, recorded in our ponderous dictionaries, there are some that seem still to be needed, among them one to define the modern taxidermist and another for what for want of a better word we call a manikin, though here, perhaps, the need is for a more gracious term for the graceful girls and stately dames who condescend to show us how garments of various descriptions should be worn. But, as I have written elsewhere, if he who delves among books in dead and living languages to decide which of the numerous, many-syllabled names some small creature is rightly entitled to bear, does not object to being called a taxonomist, he who toils over the skins of creatures great and small to make them live again, should not object to the rightful name of taxidermist. Some have styled themselves animal sculptors, but this does not distinguish the taxidermist from the artist whose work is translated into lasting stone or enduring bronze. Animator might be suggested for one who puts life into such a hopeless looking object as the skin of a rhinoceros, but for the present we will stick to taxidermist.

So we have only the word taxidermist to cover all grades of preparators including those who have been

aptly styled perpetrators, whose work can only be considered as art because it certainly is not nature.

As for manikins, these range from inanimate forms of wood and plaster, covered with the skins of wild beasts to those of flesh and blood, draped or undraped in silks and satins on whom are displayed the triumphs of the dressmaker's art. There have been forms carved in wood, or on a large scale, laboriously built after the manner of a small house; there have been shapes of iron and excelsior and tow, covered with clay in which were impressed details of anatomy; there have been casts of dead animals of paper or plaster, hollow or solid, and there have been some excellent forms consisting of a skeleton of wood clad in wire cloth on which the muscles were modeled in papier maché, but it remained for Akeley to combine their excellencies and omit their defects in the Akeley manikin.



Akeley has told in his reminiscences how he became a taxidermist, but he has not told us that in my early days I, too, had ambitions in that line, though circumstances decided otherwise; as for Akeley, he shaped circumstances instead of being shaped by them. We both drew our inspiration from the same source, though Akeley did not know it. We do not always realize how the threads of our lives are interwoven with those of others, oft-times with those of people of whom we have never heard, and that Akeley and I should meet after many years was due to Prof. J. W. P. Jenks, whose name even was unknown to Akeley; for Professor Jenks imparted to my uncle his simple methods of taxidermy and my uncle taught me; also he published the little book on taxidermy, "price one dollar," to which Akeley refers and

from which he learned taxidermy up to a point where he felt justified in having business cards printed stating that he "did artistic taxidermy in all its branches."

In one little particular Akeley errs in his memoirs, in thinking that the



JOHN WALLACE.—One of the earlier well-known commercial taxidermists of New York.
Courtesy of U. S. National Museum

painted background he introduced in a group of birds, almost at the outset of his career, was the first of its kind: like other "inventions" this has been "discovered" several times, and even when he was painting the background, the Booth collection—begun in 1858—was well advanced.

As Booth wrote, "the chief object has been to endeavor to represent the birds in situations somewhat similar to those in which they were obtained, many of the cases, indeed, being copied from sketches taken on the actual spots where the birds themselves were shot." And half a century earlier that uni-

versal genius, Charles Willson Peale, himself a taxidermist, wrote, ". . . it is not only pleasing to see a sketch of a landscape, but by showing the nest, a hollow cave, or a particular view of the country from which they came, some instances of the habits may be given." Had Peale lived a hundred years later he would have been a leader in museum methods.



Like Akeley I, too, went to "Wards," preceding him by fifteen years, "graduating" five years before he came; and it was many years before we ever met, for it was not until 1912 that our paths came together and we became associated in the American Museum of Natural History.

How Akeley came to "Wards," as Ward's Natural Science Establishment was briefly styled, he has recorded in *In Brightest Africa* and elsewhere, and here he worked from 1883 to 1887, not a very long time, but long enough to convince him that it was no place for him to develop his ideas of what taxidermy might be.

Even that time was shortened by a few months which he passed in the workshop—by no stretch of the imagination could it be called a studio—of John Wallace, a New York taxidermist who probably stuffed, most literally, more animals than any other one man.

Naturally, a commercial establishment, and particularly one that dealt mainly with the preparation of single specimens for museums, offered little opportunity for artistic, or naturalistic,—call it what you will,—taxidermy. For that was the era of the single specimen, the time when Coues wrote, "'Spread eagle' styles of mounting, artificial rocks and flowers, etc., are entirely out of place in a collection of any scientific pretensions, or designed for popu-



CARL AKELEY and J. WILLIAM CRITCHLEY.—Taken in 1885, the year in which they mounted Jumbo

lar instruction. . . . Birds look best, on the whole, in uniform rows, assorted according to size, as far as a natural classification allows."

The severely simple was considered the proper style for museums, and one curator, whose name stands high in the list of zoologists, objected to the introduction of a bone as an excuse for a

little action on the part of a coyote.

Truly *tempora mutantur*, and there are times when I feel that now-a-days too little attention is being paid to single specimens and that their importance is not recognized, nor their value to a large proportion of visitors sufficiently appreciated.

A physician once told me that one of

a doctor's most important duties was to tell his patients what *not* to do—so if Akeley did not gain much positive knowledge at Wards he saw many things that might be improved, and he did have an opportunity to study the problem of mounting large mammals, even if he did not have an opportunity to put the results of his observations into practice.

It was probably during his stay at Wards that Akeley reached the conclusion that the taxidermist had evolved from the upholsterer (as a matter of fact I have been asked "Who upholstered that specimen?") and that the process of evolution had not gone very far. At any rate, he soon recognized that it was not possible to get good results from the methods then in vogue, which consisted mainly in turning an animal upside down and most literally "stuffing" it full of straw. Having recognized this fact, he set for himself what was to prove his life's task—the devising of processes by which the then existing order of things might be remedied.

It was at Wards that he first took part in mounting an elephant, the once famous Jumbo, whose name has been embodied in literature and handed down to posterity in dictionaries as a synonym for something big: And yet the majority of the present generation never heard of Jumbo. Had Rip Van Winkle lived in the present rapid age he might well have uttered his plaint—"Are we so soon forgot?"

In mounting Jumbo, Akeley was under the direction of his senior, J. William Critchley, and the elephant was mounted much after the fashion of the specimen in the Museum of Natural History, Paris, put up more than a century ago. Critchley was a versatile and skilled taxidermist, ac-

cording to the standards of his day, who had few equals in mounting birds, and few superiors with the average mammal; he was selected on the advice of Doctor Hornaday as chief taxidermist for the growing Brooklyn Museum in 1903. He died in 1910.

However, before Jumbo was finished, it was Akeley who was supplying the ideas, but it was not until 1913, many years later, that he devised the method now employed for such large animals as rhino and elephants.

It was a tenet of the old-time taxidermy that skins must be tanned in a salt and alum bath both to "set" the epidermis and to dry hard so that they would retain their shape when dry. This method was not conducive to the longevity of specimens, and especially of our larger quadrupeds, which, if exposed to the changing atmosphere of our museum halls, soon went to pieces.

My doubts as to the permanency of museum specimens was aroused by an English report on bookbindings which reached the conclusion that nothing save Sumach Tanned Morocco leather was durable: and to tan a rhino—much less an elephant—with sumach seemed a somewhat difficult proposition.

When the big hippo Caliph, for twenty odd years a resident of the Central Park Zoo, was being mounted at the American Museum of Natural History (this was before my time), I remarked, as Cassandra might have, that it seemed a pity to cover such admirable modeling with skin that was pretty sure to go to pieces—as it did not many years later. For Caliph, prepared with great skill after methods long followed, slowly disintegrated under the stress of our dry-heated halls and within a decade was stripped of his skin, though still exhibitable on account of his excellent modeling.



MODELING THE BIG BULL FOR THE GROUP OF AFRICAN ELEPHANTS INTENDED FOR THE CENTER OF THE AFRICAN HALL

Small wonder that, having so often seen specimens go to pieces, I had serious doubts on the subject of museum exhibits and was inclined to feel that it was a waste of time and money to mount animals doomed so soon to come to an untimely end; of what avail to make an animal live again if its second lifetime was to be no longer than the first, possibly even shorter.

Here again is where Akeley contributed to the improvement of museum methods, and after a little experimenting found that there was on the market a vegetable tan that fulfilled all the desired conditions and was just what he needed for such huge creatures as rhinos and elephants, a matter of great importance, since Akeley's latest methods of mounting large mammals, in which the skin was modeled directly upon the clay, depended largely on the successful tanning of the hide which must remain soft and flexible for many days and yet not even suffer the loss of any epidermis.

The final test is yet to come, for so far it has not been tried on a hippo, though there is no reason to believe that it will fail here, provided Akeley's careful procedure is followed.

It was while at Wards that Akeley, or rather the Museum World, had a narrow escape, for his friend, Professor Webster, advised him to study for entrance to the Sheffield Scientific School with the intent of following a professional career. His failure to do this was due to a breakdown in health which prevented him from taking the examination, and while later, at Milwaukee, he was encouraged by Professor Wheeler to try again, fortunately the plan fell through; I say fortunately advisedly, for while there are multitudes of professors there are or have been few really good museum men, and

only one Akeley. Still, it is doubtful if he would have remained a mere student, for owing to his mechanical bent he liked to do things with his own hands, to carry out his own ideas rather than follow those of others.

After four years Akeley "graduated" from Wards, not because of what he had learned but because it offered no scope for his ever growing ideas, and in 1888 he followed his friend, Professor Wheeler, to Milwaukee.

In the Milwaukee Museum he had a little more scope for his talents, though at first hampered by museum traditions, and here he installed his first habitat group—of muskrats,—in the making of which he tells us he was tolerated, rather than encouraged. Later, when Professor Wheeler became director of the Museum, Akeley was given the freedom he desired, though not until he went to Chicago did he have full scope for his talents.

Now, I am somewhat hazy as to just when Akeley began to be recognized as a leader in taxidermy and to whom belongs the credit for that recognition, but certainly in 1892 Mr. W. H. Holmes, then on the staff of the Field Museum, selected him to mount a horse—and no animal is more difficult to mount—for one of the exhibits in the U. S. National Museum at Chicago in 1893. What may be called Akeley's first public recognition came in 1895, at the first Sportsman's Show held in New York, where he obtained the first prize for the head of a Virginia deer entitled "The Challenge," the most admired game piece in the exposition. Here again was a crossing of life's threads, for Theodore Roosevelt, who fourteen years later was to take part in an elephant hunt with Akeley, was the judge who awarded him the prize.

From Milwaukee, in 1895, Akeley



THE SLOPES OF MOUNT MIKENO, THE RESTING PLACE OF CARL AKELEY

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AKELEY'S AFRICA
Paradise Valley, from a photograph by Martin Johnson

went to what was then the Field Columbian Museum where he had a chance to put into practice ideas and methods that had been awaiting an opportunity, and after his first African expedition, in which he showed his skill as a collector, year after year he installed the groups that were figured in the reports of the rapidly growing institution. Here, as an incident, he invented the cement gun, one of the few inventions that brought him any financial returns, and here his fertile brain devised many improvements in museums and museum methods, some of which are still untried.

It was at the Field Museum, in 1902, that Akeley installed his "Four Seasons," four groups of the Virginia deer amid their appropriate surroundings in spring, summer, autumn, and winter. These, begun during his stay in Milwaukee, had long been in course of preparation, and when they were secured by the Museum, Akeley, as is often the case with inventors, found that while he "had come out even on expenditures for labor and material, for his own time and for profit there was nothing." That he met with similar experiences later in his career was due to the fact that he placed excellence first and profit last, and if, in the course of a piece of work, he saw a way in which it could be improved, he never failed to use it, though at the loss of time and profit to himself. This was probably the principal reason why the taxidermy establishment carried on by Akeley in Milwaukee was not successful, although it had the support of the Museum; really good work is so expensive that it cannot be carried on commercially at a profit.

The "Four Seasons" were originally mounted to be seen by daylight, for at the time of their construction electric

lighting was still young and only gradually finding its way into museums, and then in very simple forms.

A point to be borne in mind is that our predecessors in museum work were sadly handicapped by the question of lighting and a goodly share of the credit for the beauty of modern museum groups is really due to the development of electric lighting; here, as in other branches of museum methods, Akeley was quick to recognize its possibilities, and had in mind many devices for the projected African Hall.

It was while engaged upon the "Four Seasons," whose surrounding foliage called for many thousand leaves, that Akeley devised the simple, rapid, and economical methods of making leaves now so universally employed in American museums, and introduced the use of metal molds to replace those of plaster that so soon deteriorated.

The Mintorn brothers, and their sister, Mrs. Mogridge, had developed a method of reproducing foliage and flowers, employed by them in the British Museum bird groups, and later brought by them to the American Museum of Natural History, where it was used in the small bird groups that in their day stood for high-water mark in groups. The results obtained by the Mintorns were very beautiful but, as time showed, they would not stand the test of our varying museum atmosphere, with its summer's moisture and winter's dryness, but curled up, so in the American Museum of Natural History they have in most instances been replaced; moreover the process was somewhat complicated and involved the use of a mysterious "fabric," which later proved to be mousselaine de soie, and it has given way to the simpler, more durable method of Akeley.

Akeley patented his process for re-

producing leaves, but never, to my knowledge, asked any royalty for its use; in fact, I do not think that he ever received any money from those who employed his methods or accepted any fee for imparting them to others. Not only this, but at the Chicago meeting of the American Association of Museums, in May, 1908, he explained in detail the making of the manikin, an explanation which led Mr. H. L. Ward, then director of the Milwaukee Museum to remark, "this address of Mr. Akeley . . . seems to be epoch making . . . the man of whom I can say without fear of accusation of flattery that he has done more for taxidermy in America than any other one person, gives to us, friends, acquaintances, and strangers, a full and detailed exposition of his method of mammalian taxidermy."

The lure of Africa and the opportunity to secure and install a full group of elephants drew Akeley to the American Museum of Natural History in 1909, and when, in 1912, he returned from a three years' collecting trip, he and I were together for the first time. And here I saw him develop his last, and most revolutionary process for mounting great mammals, a process that was not perfected until the work of mounting the first elephant was actually in hand, when Akeley discarded the frame already made for the manikin, abandoned his original plan,

and proceeded to carry out the method then and since used for big quadrupeds. The group intended for the center of the African Hall bears testimony to the success of the method, and the Asiatic elephants and other large mammals mounted for the Asiatic Hall, show how well it has been followed by his associates.

It was while engaged on this group of elephants that he perfected his plans for the African Hall, which had long been uppermost in his thoughts, which he looked forward to as the culmination of his life's work, but which, it was decreed, must be left for others to carry into execution.



Like many another genius, he did not live to see the realization of his fondest hopes, to see his vision of a great African Hall taking tangible form: he was cut down at the very moment when success seemed near and his dream about to come true. The mind that planned and the hand that executed are stilled in death, the mortal part of Akeley reposes on the distant slopes of Mount Mikeno, but his spirit lives, and the work to which he devoted so many years and so much of his best thought will be carried on by those to whom he imparted his ideas and imbued with his enthusiasm. And on them devolves the task of executing a fitting monument to his memory.



Groups in the Field Museum and Elsewhere

While a large share of Akeley's time during his connection with the Field Museum was spent in the preparation of groups of animals obtained during the expedition to Africa in 1895-1896, yet other desirable pieces were added as opportunity offered. Due largely to existing conditions these were "open groups," intended to be seen from four sides. A special expedition was made to secure a notable pair of African elephants



POLAR BEARS

Mounted by Carl Akeley in 1900

Courtesy of the Field Museum of Natural History



MUSKRATS AT HOME
Akeley's first "habitat group" mounted about 1893. Courtesy of the Public Museum of Milwaukee



LESSER KOODOO
The first of the African groups, mounted by Akeley in 1897. Courtesy of the Field Museum

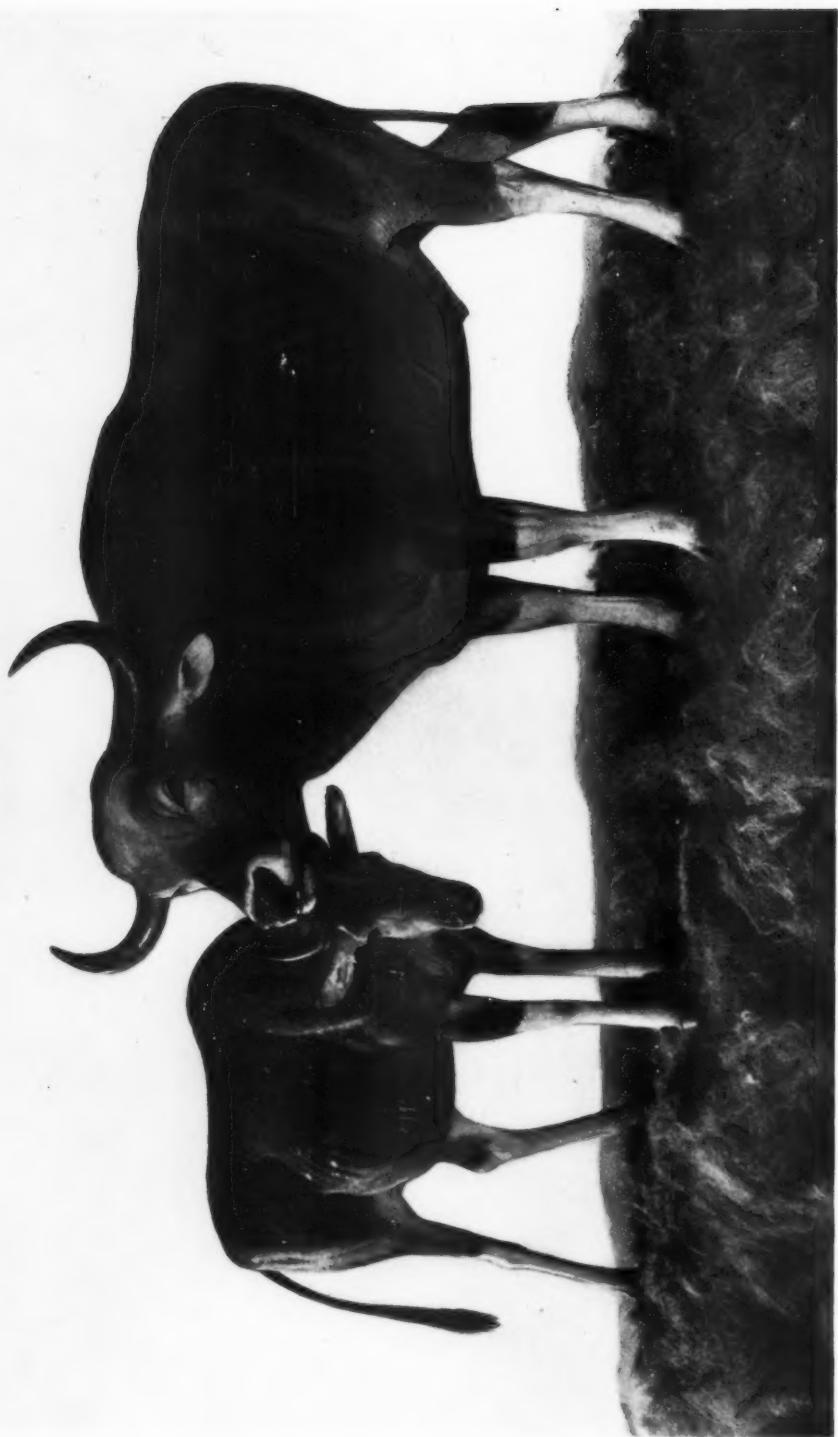


WART HOG, NORTHEASTERN AFRICA

Mounted by Carl Akeley in 1901. Courtesy of the Field Museum



AFRICAN BUFFALO
Mounted in 1914. The last group made by Akeley for the Field Museum



INDIAN WILD OX; BANTING
Obtained by the 1923 Faunthorpe-Vernay Expedition for the Asiatic Hall of the American Museum. Mounted by J. W. Hope. A good example of the delicate modeling obtainable by the Akeley method



INDIAN RHINOCEROS

Obtained by the 1923 Faunthorpe-Vernay Expedition for the Asiatic Hall of the American Museum. Mounted by Robert H. Rockwell by Akeley's latest method. Not only does this permit great detail in modeling, but the finished specimen is very light. This rhino weighs very little more than did his skin alone



ASIATIC ELEPHANT

Obtained by the 1923 Faunthorpe-Vernay Expedition for the Asiatic Hall of the American Museum. Mounted by Louis Jonas. Photograph taken to show the fine modeling of the head: such results can be obtained only by Akeley's method in which the skin is modeled directly upon the clay



Proposed background for the gorilla group. In the foreground is the spot where the "Old Man of the Mountains," largest gorilla, was captured. Chaninagongo looms smouldering in the distance

In Africa with Akeley

By MARY HASTINGS BRADLEY

ALL through Carl Akeley's letters to us during 1920 and 1921 there ran an ever increasing longing to return to Africa. He wondered that he had been so long away. The dream of the great African Hall was always in his mind, and he wrote of plan after plan for groups and bronzes; then the gorilla took possession of his imagination.

Not one gorilla in any museum in the world was mounted by a man who had ever seen a wild gorilla, and not a specimen of the central or mountain gorilla was in any museum in America. Akeley began to dream of a group of the great apes that would dominate the

African Hall; his letters were full of plans shaping to realization, and at last his urgent, "Will you come?" made us sweep away those obstacles that interpose between every-day living and the opening of the door to adventure.

There were six of us who set out in June, 1921; Mr. Akeley, Miss Martha Miller, his secretary at the Museum and our very good friend, my husband and myself, and our five-year-old Alice, with Miss Priscilla Hall of Chicago as Alice's guardian.

Akeley had a whimsical humor in including a child in the party of gorilla seekers. His belief in Africa made

SUNRISE OVER THE GORILLA MOUNTAINS
The three mountain peaks—Visoke, Mikeno, and Karissimbi—comprise the gorilla sanctuary. The photograph was taken from the rim of the volcano Nambagira



him wish to take her, and our belief in him relied upon his judgment. He wrote, "You see, one of the points of our expedition is that we are going to take the bloom off the heroes who have gone before, because we tackle what, in the public mind, is the most hazardous, the most difficult thing that the African jungle has to offer. We cannot possibly come out of it as heroes, taking women and a baby, but we can pull the other heroes off their pedestals—which is quite as much fun."

We sailed from New York to London where our mountain of equipment was waiting, then from Southampton, August 12, on the "Kenilworth Castle" for Capetown. The voyage was memorable for our shipboard acquaintance with General Smuts; he was much interested in the gorilla expedition and in Akeley; they were men who knew how to value each other's strength, integrity of purpose, and resourceful energy.

From Capetown we took the train north. The veldt, barren of its old wild life, was depressing to Akeley; he felt that the real Africa was gone. The first wild animals we saw or heard were the baboons near the grave of Cecil Rhodes.

Victoria Falls was of absorbing interest to Akeley photographically, for with the Akeley camera he could photograph the whole story of the waters—following the rush of them over the brink to the chasm below, then up in air to the ever-changing cloud of mist that fell again. Only the Akeley camera could do that. This motion-picture venture, which my husband shared, was to be the record of what Akeley called the "high spots" of our trip—and literal high spots they proved.

We entered the Congo by rail, at Sakania, more rail brought us to

Elizabethville and—ultimately—to the upper Congo, called the Lualaba River. The steamer on which we had expected to travel was hung up on some sand bar, and we were lucky to get stowed in and on a steel barge, towed by a small river boat, for our river journey.

The Lualaba was very beautiful, and the most beautiful things to Akeley were the tall borassus palms, the loveliest trees in Africa. For hours we glided between high ranks of them rising like wraiths from the river mist; then they gave way to lesser palm, acacias, and swamps of feathery papyrus.

The bird life was marvelous. There were clouds of black ibis that settled dramatically upon the bare-branched, yellow-flowered trees, and rayed out like a storm before the on-coming steamer; there were egrets, golden-crested crane, heron, goose, eagle, plantain eaters, shoebill stork—an infinite variety.

From Kabalo, a river post, after a five-day wait, a last bit of train took us to Albertville on Lake Tanganyika; then, after more days of waiting—quite a feature of African travel Akeley used to say—the steamer "Baron Dhanis" took us to Usumbura, at the northern end of the lake.

Our real safari began here. With two hundred goatskin-clad porters, our equipment on their heads, and our ragged camp boys, we six whites started the march north over the Rusisi mountains into the Kivu. On this safari we had to deal with a very different situation from that in British East, where expeditions are the order of the day, and trained gun boys, tent boys, cooks, and porters are for hire. This was the Congo and the interior; no one came here but the official or missionary with few personal servants. There were no trained boys to be had,



LIGHT AND SHADOW ON THE SLOPES OF MOUNT MIKENO
Clefts and ravines such as those are typical of the gorilla region, which is at least 9000 feet above sea level

and porters would go but short trips from their villages.

The Belgian officials gave every assistance, but they could not conjure trained field servants out of the middle of Africa, and our camp life was a succession of emergencies, so different from the organized performance of British East to which Akeley was accustomed that he was baffled and exasperated. He was so eager to show us Africa at its brightest that our make-shifts with service grated horribly upon his standards. We had four cooks in as quick succession as we could achieve, and after some peculiarly joyless version of dinner, Akeley's reminiscences of his old chefs would have surprised them with his fervor, and his old boys shone with brighter and brighter luster. He missed Bill, his old English-speaking boy, gun boy and interpreter, very genuinely.

We were marching during the Rains and the narrow paths were heavy with sticky, red mud.

"I hate a bird," said Akeley suddenly. His gaze followed a bird soaring ahead. "Just spread their wings and go—never get in the mud at all. Damn birds!"

We had brought bicycles, for Akeley had used them in British East; they were of real use to us later, but now were carried. We had no transport but our feet, for Akeley refused to use the chairs in which whites usually traveled in the interior; he scorned being carried.

I think that he accepted wheels because there was effort in propelling them; he had a hatred of anything easy and self-indulgent. His feeling that one had to work for a thing made him feel that one must work, by walking, to have a right to Africa. His physical strength was great and he

was eager to prove it undiminished. Day after day his determination poured out that strength in the sheer mechanics of walking; fever began to rise and often he got to bed as soon as we made camp.

It was part of Akeley, that unsparing determination; he had arrived by it, and I know that it had its way with him to the end.

On the eighth day we saw Kivu, loveliest of African waters, and the lake realized even his dreams. The air was crystalline during the Rains and the color was sheer magic. We journeyed north in a launch arranged for by the Belgian government, and from Lake Kivu Akeley had his first glimpse of the triangle of old volcanoes that were his objective—Mikeno, Karissimbi, Visoke—rising from the clouds of the storm beating upon us. On those heights he hoped to find his gorillas.

He was worried until he could be on his way to them, and he was pressed for time by lecture engagements made for his return. Every day counted. And the chances were incalculable.

We camped at Kissenyies, the Belgian post of four whites, and as soon as thirty porters came in, Akeley went ahead three days to the mission of White Fathers at the base of Mikeno, then with guides from the sultan Burunga, he started up the mountain.

We sent on relays of beans to feed his men up there; we made a trip around the mountain to meet T. Alexander Barns coming down with three gorilla specimens for the British Museum; then, as soon as we had porters, we followed to the mission, where we left Alice and Miss Hall, and went up Mikeno to Akeley.

Runners had already brought the good word that he was finding his gorillas, but the news he wrote of his ill



AKELEY'S CAMP AT THE BASE OF MOUNT MIKENO AND MOUNT KARISSIMBI
In the distance the morning mist is just clearing before the craggy peak of Mount Mikeno



THE GORILLA CAMP
Some gorilla skins are hanging up to dry, while others are spread out in the foreground. A small gorilla preserved complete in formalin and salt is hanging from the tent

health made us do a two-day climb in a day of nine hours to join him.

Those days on the gorilla mountains had a quality beyond anything that any of us had known. The beauty of the heights was an enchantment. We were in an upper forest, above the dim twilight of the bamboo, a forest unlike anything else in Africa. Fantastic trees with heavy crotches and long, outreaching arms burdened with heavy moss . . . a netted jungle of undergrowth sometimes breaking into waves of delicate bloom . . . chasms, whose clifflike sides would have been arid in other climates, Akeley pointed out, but here were clothed in wild luxuriance.

It was a forest out of an old fairy tale, Akeley felt, and the gorillas were its giants. He gave his sentiment free rein; the place appealed to all the fancifulness of his beauty-loving nature. I have never known him more content than with those days, exhausting as they were.

The tangled greenery through which we made our way, day after day, seeking traces of gorilla, was burning with nettles and sodden with rain; we were from 10,000 to 12,000 feet up, and the nights were piercingly cold in the chill damp; the days were June when the sun shone, raw November in the fog. There was scarcely enough dry firewood for the cooking. The guides deserted but were sent back by their sultan, the porters were threatening to run away. There was never a moment to be lost, either in the hunting or the photographing, or in the preparation of the skins, the drying of the skeletons, the embalming of the young gorilla which Akeley had undertaken.

Akeley always worked like ten. Few men could have done what he did on those mountains. He was profoundly

satisfied with his experiences; there were five gorillas for the group, a male and two females that he had shot, the male of Karissimbi that my husband shot, and the young gorilla that the natives speared—and everything in the behavior of the gorillas hunted or observed (and we saw them singly and in bands) confirmed his belief in the Credo that he had written on his way to them.

"I believe that the gorilla is normally a perfectly amiable and decent creature. I believe that if he attacks man it is because he is being attacked or thinks that he is being attacked. I believe that he will fight in self defense and probably in defense of his family; that he will keep away from a fight until he is frightened or driven into it. I believe that, although the old male advances when a hunter is approaching a family of gorillas, he will not close in, if the man involved has the courage to stand firm. In other words this advance will turn out to be what is usually called a bluff."

"I believe, however, that the white man who will allow a gorilla to get within ten feet of him without shooting is a plain darn fool."

Another cause for Akeley's satisfaction was that he took the first pictures ever made of wild gorilla. This he accomplished with the "Gorilla," a motion-picture camera he had prepared expressly for the forest conditions of light.

The rarest day of the experience was the day that my husband killed the big gorilla—the lone male of Karissimbi. Carl Akeley, Herbert Bradley, Martha Miller, and I were all in that hunt, and the mountain-side on which it took place, where the gorilla fell, was the spot that Akeley pronounced the most beautiful in the world.



Castle peak of Mount Mikeno. Part of the gorilla sanctuary

We were high on the slopes of Karissimbi, space around us like a sea. Mikeno rose on our right, its rocky summit vivid against a sky of burning blue. Below us stretched a world of mysterious forest, shimmering lakes and distant mountain ranges, and before us the cloud and fire of the volcano Namlagira flamed like a funeral pyre between the branches of the dead tree at whose base lay the gorilla.

It was a dramatic thing, that dead gorilla in that place of unearthly beauty, and Akeley said, "I envy that chap his funeral pyre." He always said that when his time came he wanted "to lay his bones in Africa," and the only comfort now to his friends is that if the end had to come, it came where he

would have wished, and he lives in Africa's eternal keeping.

In a letter to us in 1923 Akeley wrote, "That morning on the slopes of Karissimbi was the high spot of my African experiences."

We were camping in the saddle between Karissimbi and Mikeno—the camp that was to be Akeley's last camp—and on several mornings the marsh before the tents, from which we got our water, was skimmed with ice and Karissimbi's peak was powdered with snow. With the shooting of the big male Akeley felt the work for the group was accomplished; the collection of background he left until he could return with a painter. Although with license for ten gorillas, he took but five.

"The Boiling Pot" of the active volcano Namakira, photographed from within the crater



Already there was forming in his mind that dream of a sanctuary for gorilla which King Albert made true.

For months we had watched the fire from Namlagira reddening the sky, and Akeley had noted that the wind came always from one direction blowing the fumes south. The expedition of the Duke of Mecklenburg had been up to the crater in 1907, but since the later eruption of fire no one had explored it, and the natives' declaration that it was impossible to cross the lava plain which separated Namlagira from the base of the gorilla mountains strengthened Akeley's determination to do it.

From the White Fathers we obtained guides and set out. That lava plain, emanating from small cones and subsidiary fissures, was a chaotic drift of ragged and broken rock, slippery with lichen, and overgrown with sparse grass that concealed only too well its treacherous crevasses. The guides took us across, but had no intention in the world of leading us up to that crater of fire; it was only by Akeley's driving the unruly headman out of earshot while the rest of us violently shepherded the reluctant porters up the heights, that we made the ascent.

We made camp above timber line, in lava rock and alpine growth, then we four whites ascended for an unforgettable first look into that crater. We were on the brink of the mountain top, looking down into a chasm about six miles in circumference, a colossal chasm blown out by at least three distinct eruptions into three abysses, separated by bastion-like walls of rock, stratified and colored, variegated by cinder slopes and table-lands of yellow sulphur beds, spouting steam, and billowing clouds.

In the center rose a citadel rock, the Castle, as we called it, amber in the

light. Through the Portal, a break in the inner walls, we saw the fire that came from the only active crater. The abyss was filled with boiling lava, from which came a booming roar like a heavy surf, as constant explosions broke through the swiftly forming crust.

The next day we gained admission to the crater by a little dip in the rim, through which we clambered down on ledges and terraces, out across sulphur beds. At first we used commendable prudence, roping ourselves together and testing every step—more than once a foot went through the brittle crust—but after the first hours we took our separate chances. We spent three days within the crater, one night on the rim, in the shelter of a boulder, directly above the boiling pot, and another night in the crater itself, on a little ledge clinging to the rocky wall, facing the opening in the rocks through which glowed the fire.

Mr. Akeley set the camera down on a cinder slope on the edge of nothing at all, and we photographed the crater, both with motion pictures and stills, in its own light. We were looking down into the crater of boiling lava, a great mass crusted with cooling, darker lava, patterned with gleaming cracks of pure gold, that darted and shifted as the stuff seethed and boiled and broke into fountains of fire, or rolled into molten rivers of hissing flame.

As night came on, the cloud above that cauldron became a glow of rose, vivid, unearthly—a rose of hell, Akeley called it—that made an inferno of those rocky walls, throwing into relief every jutting ledge and rock, filling with mysterious shadow the deep recesses and dark distance. High above the crater that rose-red cloud streamed out against a sky its fire made black. . . . We sat on that ledge half the night,

the glory of that spectacle in our eyes, the thunder in our ears.

Mikeno and Namlagira were the high spots; what followed were the usual hunting experiences. We went out to the Ruindi plains south of Lake Edward after lion, buffalo, and elephant. From the Ruindi we saw the wall of mountains west of Edward sheltering that wild country that was the goal of our second trip into Africa. We marched out from the Congo from Ruchuru across the mountains into Uganda, by Kabale and Lake Bunyoni, that vivid blue lake framed in black euphorbia trees that was second only to Kivu in Akeley's appreciation. It was the only place in the world, he said, where lotus, papyrus, and bamboo

met. Motor cars met us at Mbarara, and after that came the boats and trains of the British territory.

Near Victoria Nyanza, Akeley showed us a grove of trees where he had rested once on a march, with "J. T." in his arms and wild monkeys had chattered down at them from trees. Now a noisy little train was puffing there and a fat Indian babu in his yellow turban was lording it over the blacks. So fast had Africa gone.

That was the spur that goaded him on in his preparations for the African Hall that was to be a memorial to Africa, a memorial now to Carl Akeley, who more than any other man gave a true vision of the African wilderness to the world.



Photograph by Martha Miller Bliven

An African flat-topped Acacia tree





Scenes from Akeley's Africa

REPRODUCED FROM PHOTOGRAPHS TAKEN BY MARTIN JOHNSON DURING
THE PRESENT MARTIN JOHNSON AFRICAN EXPEDITION



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MRS. MARTIN JOHNSON—"OSA"

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MRS. JOHNSON AND THE BIG CROCODILE



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ZEBRAS AND OSTRICHES
A fortunate snapshot of wild life on the plains of Africa



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A HANDSOME SUBJECT FOR THE CAMERA

The bait hung about five feet above the ground, and as the leopard struck at it, he released the flashlight





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YOUNG LION

He is gazing, unalarmed, into the light of the flashlamp which is turned on him

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AFRICAN BUFFALO

This old bull carried away the flashlight wire with his horns as he stooped to drink



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BLACK RHINO

A scarred old fighter on the shores of Lake Paradise





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Above — A spotted hyæna taking his own picture as he stops above the bait
Below — A jackal stepping on a disc switch as he contemplates the bait overhead





Epilogue

By HENRY FAIRFIELD OSBORN

President, American Museum of Natural History

WE wish that Carl Akeley could have lived to see the present number of NATURAL HISTORY with the glowing tributes of nine of his admirers, colleagues, and friends. To very few is it given to attain an international standing and to be known and admired on two great continents. Akeley's love of Africa and African life grew upon him year by year from his first great journey with Daniel Giraud Elliot, which resulted in the superb groups in the Field Museum.

Much as he loved his own country, Africa became his paradise, not only of great mammals but of nature in her grander forms and moods, and of the natives in the courageous aspects of their lives. As Herbert Ward, in the superb bronzes depicting the nobler expressions of the African native, has put into enduring bronze his tribute of admiration, so Carl Akeley in the three scenes of the African hunt has portrayed the unflinching courage of the Masai native, as well as the final heroic charge of the lion and lioness upon their intrepid foe. Often have I heard him speak of his admiration for these Masai hunters.

Akeley's first love was perhaps for the elephant, but in his closing years he conceived a great admiration for the lion, and his final work on the lion group is perhaps overtouched with sentiment. Often did he dwell upon the nobility of the elephant, its courage in the charge, its sympathy in removing the wounded comrade. Little wonder, with sentiments like these, that he entitled the chief literary work of his life *In Brightest Africa*. Little wonder

that, in the confines of the great city of New York, he longed for the sweep of the African plains and savannahs, for the unspoiled beauty of the African forests, for the majestic march and trumpeting of the elephant, and for the dauntless charge of the lion.



It was Akley's wont to concentrate his imagination and creative power, as well as his energy, upon one great object at a time. Soon after he joined the naturalists of the American Museum, he began to plan the African Hall, and worked upon this day and night until the faultless plan was achieved. This was immediately published so that the thought of a centrally darkened space with outlooks into vividly lighted and wholly naturalistic scenes of African life at once became the motive for similar designs in other museums.

Then he sought to surpass himself and his own great animal designs by discovering a new method which would enable him to give the last living touches to his models, after the manner of the sculptor in clay. He himself told me that the clay method flashed into his mind while he was starting on a theater party with a group of friends, who laughed when he suddenly exclaimed, "I have discovered a new and far superior method of modeling and mounting animals." This is the now commanding Akeley method, which he imparted to several of his pupils in mounting the African elephant group, and through which for the first time these pachyderms give

the entire semblance of life to mounted animals, especially in the delicate display of the muscles of the face, of the eyes, and of the nostrils.

There followed a two-year period of trial and error, of dauntless experimentation, inventing the now world-famous Akeley camera—the peer of cameras of the field. During the war, this same fiery intensity was given to the great Akeley reflector which was to be his principal contribution to the cause of the Allies.

Immediately following the death of Theodore Roosevelt, he turned the entire force of his genius into the designing and setting of the giant leonine statue which he believed best to envisage the commanding spirit of his beloved friend. Certainly the greatest disappointment of his life was the report that the Theodore Roosevelt Memorial advisers had decided that this great design could not be accepted after his two years of unparalleled labor. At the very close of this memorial effort, he produced what he believed to be the most commanding figure of a lion, a copy of which shall be placed in or near the Roosevelt Memorial Hall.

Finally, it is delightful to record that, only a brief twelve months before his death, there came the long cherished opportunity actually to begin the execution of his African Hall plans after years of baffling discouragement which would have crushed all the ambition of the less courageous and less persistent personality.



Our first thoughts on hearing of Akeley's passing on the slopes of Mount Mikeno were that it was given to him to pass away near the scene of his greatest achievements and to be buried

where he most wished to lie. The lines of Stevenson's "Requiem" come to our minds;

Under a wide and starry sky
Dig the grave and let me lie.
Glad did I live and gladly die
And I lay me down with a will.

This be the verse you grave for me:
"Here he lies, where he longed to be;
Home is the sailor, home from the sea,
And the hunter home from the hill."

It is fitting, too, that Carl Akeley lies within the area which through his idealism and through the idealism of Baron de Cartier de Marchienne has become for all time the sanctuary of the mountain gorilla. Had it not been for Akeley, these monarchs of the ape world would doubtless all have perished as trophies of the hunter and spoils of the various museums of the world. Akeley not only redeemed the anthropoid tribe, but he redeemed the reputation of the gorilla from the misrepresentations and exaggerations which from the time of Du Chaillu had made these inoffensive animals the personification of brutality and of satyrysm, as portrayed in the sculpture of Fremiet. For this undeserved reputation Akeley substituted a benignity of domestic life, portrayed in his masterpiece the Gorilla Group, disturbed only at the approach of a foe which threatens the family.



In closing this series of tributes to Carl Akeley—the Conservationist, the Explorer, the Sculptor, the Inventor, the Patriotic Citizen, the Idealist, the Typical Self-made American Man, I wish to express once more the everlasting debt which all the museums in America owe to the life work of this remarkable man. We may only esti-

mate the full measure of our debt by considering what the standards, not only of this Museum but of all museums of America, would have been without the sweep of his great achievements, which gave us a wholly new conception of the mammalian kingdom and of the close portrayal of nature in animal habitat groups.

May we not consider that the most appropriate dedication of the African Hall shall be to the memory of the man who conceived it and practically gave his life for it—Carl Akeley. The

climax of Akeley's life ideals is embodied in his plans for the African Hall. The peak of his life ambition was reached when he started out with two of his greatest benefactors and two artists to give entirely unrestricted rein to the beginning of this central and crowning effort of his life—the African Hall. Like the great leader of the Hebrews, he passed away after many years of undaunted courage and effort at the very moment when the promised land was in sight,—in fact, within his very grasp.

NOTES

CARL ACELEY

Colleagues, comrades, and friends of the late Carl Akeley gathered together at the American Museum on the afternoon of December 21, 1926, to pay a series of tributes of admiration for his character, and of devotion to his memory. President Henry Fairfield Osborn presided. The speakers presented the versatile genius of the man whose name they had come to honor, and Carl Akeley as explorer, sculptor, inventor, and conservationist, was memorialized. These addresses appear as a series of articles in this issue of NATURAL HISTORY.

Numerous tributes came from various parts of the United States and from abroad, by telegram and by letter, and were read by Director Sherwood at the beginning of the meeting. They are as follows:

From Mr. Akeley's co-worker and friend, Martin Johnson, in a cable from British East Africa:

Akeley's death a terrific blow, a great tragedy, and a personal loss that I shall always feel. I am thankful he found a last resting place in the spot he loved.

From Stanley Field, president of the Field Museum in Chicago:

We sympathize with the American Museum of Natural History and the scientific world in the loss of Carl Akeley.

From James Gustavus Whiteley, Consul of Belgium.

It is gratifying to think that, although he was not spared to complete his work with his own hand, he

must have had the satisfaction of knowing that his cherished ideal was well started and cannot fail to be realized.

From Mr. S. M. Hunter of Chicago:

Mr. Akeley, in a letter of March, 1910, from Uganda, writing us of Roosevelt used these words: 'Lord, but he is a man.' In an association of thirty years I can say the same of Akeley.

From Mr. and Mrs. H. E. Bradley of Chicago:

Akeley's works live after him, but Akeley is gone and we mourn the friend.

From Dr. Herbert J. Spinden, Peabody Museum at Cambridge:

He had breadth of vision and depth of vision, but most of all he had simplicity, and this, it seems, is the mark of true greatness.

From Mr. Joseph N. Teal of Portland, Oregon:

I loved and admired him both as a man and as an artist. His untimely death is an irreparable loss to his family, his friends, and the world.

From Roy Chapman Andrews:

His warm and loyal heart made him a dear friend, his brilliant mind an inspiring colleague, and his genius a notable figure in the life of the nation as well as the Museum. Akeley never can be replaced.

The following telegram received from His Majesty, King Albert of Belgium, was read by Baron de Cartier de Marchienne:

On the occasion of the Memorial Service held in honor of Dr. Carl E. Akeley, please convey to President Osborn and the authorities of the American Museum of Natural History the expression of my sincere sympathy. The death of this eminent naturalist and explorer is a great loss for the entire scientific world. Pray extend to Mrs. Akeley my heartfelt condolences.
(Signed) ALBERT.

The following resolutions, passed by the Holland Society Trustees were read by the President of the Holland Society, Dr. Fenton B. Turek:

At a meeting of the Trustees of The Holland Society of New York, held on the ninth day of December, 1926, the following Resolutions were unanimously adopted in reference to the death of Carl Ethan Akeley recipient in 1922 of The Holland Society's medal for distinguished service in the science of exploration:

Resolved, That the eminent achievements in Natural History of Carl Ethan Akeley have been glorified by the modesty, the persistency, the disregard of self and, above all, the undaunted courage with which his heroic and notable service in the cause of science invariably has been rendered. The splendor of his accomplishment is emphasized by his tragic death while still ardently engaged in the prosecution of his lofty aims. But, as in the case of all great spirits, in death he remains victorious—since already he had rescued from oblivion so large a part of the Natural History of the wilds of Africa and preserved it for use in future scientific study and investigation throughout the world.

Resolved, That this expression on behalf of The Holland Society, of its deep sorrow in Mr. Akeley's untimely death, in the midst of his great undertaking, be extended to his colleagues in the American Museum of Natural History and to his wife and family and devoted friends.

Resolved, That a copy of these Resolutions, suitably engrossed, shall be presented to the American Museum of Natural History for permanent record in its African Hall.

At the request of Mr. James B. Ford, the president of the Explorers Club, Mr. Kermit Roosevelt read a short memorial which had been prepared by the Club:

The members of the Explorers Club record with deep sorrow the death of their colleague and former president Carl Ethan Akeley.

In Mr. Akeley were combined the imagination of the artist with the discriminating hunger for simple truth which is the ideal of science. He carried high purpose into the field of exploration in his beloved Africa, inspired by a passion that his fellow men might henceforth be enabled to catch glimpses of the peerless wild life of that great continent as if through his own fortunate eyes.

A man of multifold genius—naturalist, sculptor, engineer, inventor, father of indispensable methods in modern museum exhibition—Mr. Akeley lived to see the success of many aspirations, expressed not only through the labor of his own brain and hand, but also through his influence upon able disciples. His lectures and writings rallied enthusiastic followers to the causes for which he gave his life.

Blessed with a genial and harmonious spirit, he was never too absorbed in his own trials, or in the vision of his aims, to counsel, encourage, and befriend those who sought assistance. He died as he himself might have wished, in the beautiful sanctuary to which his zeal had given birth, and in the comradeship of those nearest his heart; but we, his friends, lament his passing and the loss to the world of his gifted and productive mind.

THE AFRICAN HALL EXPEDITION

MRS. AKELEY, who before her marriage to Carl Akeley in 1924 was Miss Mary L. Jobe, continued her husband's work for four months in the field, from November to February. Although this was her first trip to Africa, she worked side by side with Mr. Akeley throughout the entire expedition. She had led numerous exploring expeditions

in Northern British Columbia, and in 1925 the Canadian government named one of the highest peaks in the Canadian Rockies Mt. Jobe, in her honor. She has given the following brief report of the African Hall Expedition. Her complete report will follow in a later issue of NATURAL HISTORY.

May 12, 1927

It was in January, 1926, that Mr. Akeley and I left New York en route for Africa to begin the work of his expedition for the African Hall of the American Museum of Natural History. As he so often expressed it, he had never before been so happy as, after so many years of effort, he was at last experiencing the complete fulfillment of his life-dreams.

The expedition was made possible through the generosity of Mr. George Eastman of Rochester, Mr. Daniel E. Pomeroy of New York, and the late Colonel Daniel Wentz of Philadelphia. When we left New York it was planned that these three gentlemen and Dr. Audley Stewart, Mr. Eastman's physician, should join us early in May, 1926; and also that in March, Mr. Akeley's staff of two taxidermists, (Messrs. R. H. Rockwell and R. C. Raddatz) should arrive to assist in collecting specimens and accessories for six groups of animals, and that two landscape artists, Messrs. William R. Leigh and A. A. Janssen, should come for the preparation of studies of African landscapes for the backgrounds of these groups in African Hall. These plans were carried out except in the case of Colonel Wentz who, in February, when on the eve of departing for Africa, was called to the Great Beyond. Our return in Africa was greatly saddened by his loss.

During the months of May, June, and July, the sportsman's party of Messrs. Eastman, Pomeroy, and Stewart, and our collecting party were either working in close proximity, or were meeting at frequent intervals. The sportsmen were getting their own bag and contributing certain specimens to the Museum's groups, while our party was collecting many specimens, and accessories and making studies for the painted backgrounds for five animal groups.

At this time in Kenya, and on the northern frontier, Mr. Akeley often worked far into the night in order to preserve the specimens. In August Mr. Akeley and I, with Mr. Raddatz, joined the Eastman-Pomeroy party, also the Martin Johnsons in the great game fields of western Tanganyika.

It was in this district that Martin Johnson obtained his great lion pictures, assisted by Mr. Akeley, who considered it most important to give his personal help in securing these records of wild animal life which he believed to be invaluable to natural science, and which, owing to the rapid extermination of the game,

would all too soon be impossible to acquire. In the interim of photography, he collected specimens for a group of plains animals, a double group, and one lucky day when he and I were out alone, he secured a complete band of nine wild dogs. In all those activities he worked incessantly and with the greatest enthusiasm. Then he suddenly became ill with fever. I nursed him for a week in our very hot camp, until his fever had subsided, and then took him in his bed in a motor lorry to Nairobi for medical attention. He had no recurrence of fever. One of the best physicians in Kenya pronounced his condition one of fatigue and not of infectious illness. After three weeks in the Kenya Nursing Home, I took him to our home in Nairobi, and there, as he was greatly improved, we prepared for our trip to the Belgian Congo, which from the very beginning he had been most eager to undertake.

Accompanied by Messrs. Leigh and Raddatz and Dr. J. M. Derscheid, a Belgian biologist, we made the trip from Nairobi, 800 miles to Kabale, Uganda, in motor lorries and in one light car. For this trip Mr. Akeley packed his own lorry and one other and worked with untiring energy in repairing bridges, where occasionally our heavily laden motor lorries broke through.

After leaving our motors at Kabale, we all went on foot with porter safari a distance of about one hundred miles into the Gorilla Mountains of the Parc National Albert. It was very strenuous. However, on one day only Mr. Akeley became so exhausted he had to be carried. Later at Rutshuru he spent one whole day making motion pictures for the White Fathers on the occasion of the opening of their new church, and two days later he spent an afternoon repairing a motor cycle for one of the White Fathers at Lulonga Mission. He never spared himself in the slightest degree.

After we reached our camp at an elevation of 9500 feet, he was exhausted and spent one day in bed, but he remarked more than once how happy he was at being again in the Kivu, surrounded by appreciative companions and ready for the completion of his gorilla work. He walked into his last camp on the saddle between Mounts Mikeno and Karassimbi. He said that at last he was "on his old trail," and "in the beautiful forest of the gnomes and fairies." While on this climb we heard the bark of a gorilla close to the trail. Often he called my attention to the lovely moss-hung trees, "the oldest forest in the world."

The day of our arrival at our high camp, at an elevation of 12,500 feet on the slope of Mount Mikeno, he told us of his 1921 experiences and apparently enjoyed being in his old camp. That night he had a chill followed by a fever, which quickly subsided. The next two days, which were very cold with heavy storms of hail, he remained in bed, saying that he felt tired and wanted to rest, but that he had no pain whatever. On the morning of the 17th of November,

after a very quiet, restful night, an intestinal hemorrhage occurred, he became greatly weakened, and at noon the end came.

Three or four times while in Africa he had told me that he wanted "to go in the harness," and "to be buried in Africa." His wishes were fulfilled. In the eight months in the field, to use his own words, he "accomplished more than in *any two years previous in the field*," and his mortal body rests in his last camp, in the Parc National Albert, which place of conservation of animal and plant life his mind first conceived, and which he considered "the most beautiful spot in all the world."

The remaining members of the expedition, Messrs. Leigh, Raddatz and Dr. Derscheid, and I worked on in the Kivu for six weeks, completing as best we could Mr. Akeley's plans for background, accessories, photographs for the gorilla group, with the survey and scientific observations of the animal life of the Parc National Albert.

After finishing the work in the Belgian Congo, Messrs. Leigh, Raddatz, and I went to Lake Hannington, in the Great Rift Valley, Kenya, completed the background, collected the accessories, and made the photographs for the group of Greater Koodoo. Mr. Pomeroy had previously obtained excellent greater koodoo specimens. Fortunately I secured photographs of the great flock of pink flamingos which Mr. Akeley had so greatly desired, and which necessitated journeying 110 miles on foot over volcanic slag. The mercury from 8 A. M. until 4 P. M. was 115° in the shade—a great contrast after working for six weeks in a temperature of 34° to 44° on the slope of Mount Mikeno in the Belgian Congo.

—MARY L. JOBE ACELEY.

WHILE ON THEIR WAY to Africa in February, 1926, Mr. and Mrs. Akeley were received by King Albert of Belgium and by Prince Leopold, both of whom, since the creation of the Parc National Albert, have shown the greatest interest in the work of this party.

When Mrs. Akeley reached Europe in late March of this year, she was informed by Mr. William Phillips, then American Ambassador to Belgium, that King Albert of the Belgians wished her to come to Brussels. On April 8 Mrs. Akeley had an audience at the Palace with his Majesty on the occasion of his birthday. At this time, in the execution of one of the last wishes of her husband, she presented to the King a painting of the Parc National Albert, Belgian Congo, and at his request gave him a verbal report of the expedition. The painting shows the "Parc" itself and the active volcano Namlogira, which Prince Leopold climbed in 1925. The picture was painted by Mr. William R.

Leigh, one of the artists of the Akeley-Eastman African Expedition.

On the occasion of this visit, Mrs. Akeley was decorated with the Cross of the Knight of the Order of the Crown, by M. Jasper, Premier and Minister of the Colonies, representing the King of Belgium. This honor, the King's own decoration, is rarely presented, and only in a few cases before has it been given to a woman. The honor was bestowed in commemoration of the work of Mr. Akeley in the Kivu, and as a recognition of Mrs. Akeley's work in continuing for seven weeks on the high slopes of Mount Mikeno and bringing to completion Carl Akeley's plans.

The aim of their mission to the Belgian Congo was to explore in detail the large reserve of fauna and flora called the Parc National Albert, comprising the volcanoes of Karissumbi, Mikeno, and Vissoke, and to secure accessories and background for the Gorilla Group. This territory was established as a Gorilla Sanctuary largely through Mr. Akeley's efforts.

PRESIDENT OSBORN presented to the Board of Trustees at their recent meeting the following letter from the Belgian Government, inviting the American Museum to participate in the plans for the scientific development and research of the Kivu region:

April 27, 1927.

DEAR DOCTOR OSBORN.

The Albert National Park (Parc National Albert) established in the Belgian Congo for the protection and scientific study of the native flora and fauna has made good progress since its organization by the Royal Decree of March 2, 1925.

The results of the Mission headed by Mr. Carl Akeley, whose premature death was such a sad loss to the development of scientific exploration, will soon be brought to Brussels by Doctor Derscheid who helped Mrs. Akeley to continue the task initiated by her late husband to collect data on the topography, the fauna, and the flora of the Parc National Albert.

I understand that Doctor Derscheid will return to Brussels at the end of May, bringing with him considerable information, not only on the climate, the fauna and the topography of the Parc National Albert, but also on the secondary game preserves and the great game reserve of the Ruindi. I understand that Doctor Derscheid made a special study of the conditions in which scientific missions might, in the future, work in the Parc National Albert, in spite of the very rigorous climate; and he has located good camping grounds and also collected precise information concerning the habitat of the gorillas. He has climbed all the volcanoes which form an

essential part of the Parc National Albert. Doctor Derscheid intends returning to Kivu in a few months and hopes to get in touch, in Brussels, with your representatives, so as to eventually settle the organization of the American scientific co-operation in the Belgian Congo through the farsighted statesmanship of his Majesty King Albert.

I would feel very much obliged if you would let me know, at your leisure, what your views are on this subject.

I have the honor to be,

Your obedient, humble servant,
BARON DE CARTIER.

In response, the Trustees unanimously adopted the following resolution:

Resolved, That the Trustees desire to express their appreciation of the action of his Majesty King Albert of Belgium in establishing the Parc National Albert in the Belgian Congo, for the protection and scientific study of the native flora and fauna, and the American Museum of Natural History will be glad to co-operate in carrying out the plans for the scientific development and research in this area.

The American Museum is keenly interested in this great movement for the conservation of the native flora and fauna of the Parc National Albert, a project which was so dear to the heart of Mr. Akeley, and all true nature lovers will forever be indebted to his Majesty King Albert for his broad-mindedness and wisdom in establishing this sanctuary.

PAINTINGS MADE FOR THE AFRICAN HALL ARE EXHIBITED AT NAIROBI.—All the paintings made on the Carl Akeley 1926 Expedition for the African Hall were exhibited at the Kenya Arts and Crafts Society, Nairobi, February 17, in accordance with a promise made by Mr. Akeley. The exhibition won enthusiastic admiration from the people of Kenya, to many of whom the exquisite beauty of the surrounding country was a revelation, for few travelers penetrate into the remote regions shown in the paintings. The artists who had been specially chosen by Mr. Akeley to make these studies are Mr. A. A. Janssen and Mr. William R. Leigh.

CARL AKELEY experienced to the last all the joys Africa could offer him, as is evidenced by the following abstract from a letter written by Martin Johnson, November 17, 1926, to Mrs. Robert Gordon McKay:

Akeley and I had some wonderful experiences among the lions in Tanganyika a few weeks ago. We had such luck that we can scarcely believe it true and I think Carl will always class these lion experiences along with his gorilla discoveries.

We were camped together for nearly three months with George Eastman and Dan Pomeroy and Doctor Stewart. Carl was busy securing the specimens for the Muesum group, Osa and I were getting movies and the rest



Carl Akeley, Martin Johnson, Pat Ayers, and Phil Percival, at the lion camp in Tanganyika. Photograph by courtesy of Mrs. Robert Gordon McKay

were shooting, then Carl's boy "Bill" led us to a most wonderful valley where we found lions galore and, they never having been molested, we had no trouble photographing them. You know this life is meat and drink to Carl and me and here was a situation that we had dreamed of but never expected to have come true. I think both of us went a little off our heads when we photographed them playing, sham fighting, feeding off zebra, rolling in the grass, yawning, and even roaring; one charged and made a great picture. In fact, we got them doing everything lions do. Day after day we went back to this valley and never drew a blank.

There was only one fly in the ointment, none of the lions had very good manes and they were mostly in places where the light was poor, but I have just finished developing the films and I am perfectly satisfied.

THROUGH THE COURTESY OF WILLIAM PHILLIPS, Ambassador to Belgium, we are able to give the following extract from the diary of Doctor Derscheid, who was with Akeley at the last.

THURSDAY, NOVEMBER 18—KABARA CAMP. The unforeseen end of this friend of us all has completely overwhelmed us.

Back in 1912, Carl Akeley had been crushed by a charging elephant, and it is a question as to whether he had ever entirely recovered his strength. His mind, on the other hand, had remained young and enthusiastic, his ideal ever lofty, and, the disproportion between his physical resistance and the task imposed upon him by his conception of a work to be realized and his iron will, became more and more accentuated. In his own words, all of his recent excursions into East Africa were mere child's play compared with the present expedi-

tion, fraught with difficulties due to the special nature of the country. His death was really caused by over-exhaustion, from which his body, already tired, was unable to recuperate. He saw in the present expedition the culmination of his African work. His strength supported him until he had reached these volcanoes, which he considered as the most splendid part of Africa, this "Pare National Albert," which had been created upon his initiative and, in large part, according to his advice. He held out on the steep declivities of the bamboo forest, and in the mud of the marshes, across the thickest of the jungles, until he reached his old camp in the pass separating the two majestic volcanoes, Karasimbi and Mikeno. There on the site of his old camp his mortal remains repose. His anxious impatience to reach this old camp as quickly as possible, his insistent desire, in spite of all obstacles, to push on from the Ruéru camp to the Mikeno camp, show the powerful attraction which this locality held for him. He had brought the best painter he was able to find, in order to record on canvas this incomparable site. This was the goal he was determined to reach, from which he would permit nothing throughout the course of the whole long route to hold him back, and this is where we shall leave him to sleep.

THIRD ASIATIC EXPEDITION

A cable received from Dr. Roy Chapman Andrews announced that he, Walter Granger, and Mr. Nelson were safe in Peking. Doctor Andrews added that Mackenzie Young had suffered the loss of the ends of three of his fingers through frostbite incurred while in Mongolia. Mr. Granger wrote March 24,

from Hongkong, that the collections made by himself and Mr. Nelson were being forwarded to the American Museum. These collections, from Yunnan Province, include stone implements, pottery, fossils, bird and mammal skins, fishes, and reptiles.

IN MEMORIAM

In the death of Dr. WALTER B. JAMES, the American Museum of Natural History has lost one of its most beloved Patrons and Trustees. Doctor James's interest as a Trustee of the Museum was intensified by an inherent love for all branches of natural history, centering naturally, however, about biology and public health. As a member of the Executive Committee, the Committee of Building and Plans, the Pension Board, and the African Hall collections, he rendered very conspicuous service.

The members of the Board of Trustees, at their last meeting, May 2, 1927, paid the following tribute to Doctor James:

The Trustees desire to record their deep sense of loss through the death of their co-Trustee and friend.

DOCTOR WALTER B. JAMES who passed away on April 6, 1927. Doctor James was elected to the Board in February, 1911, and served as a member of the Executive Committee from 1911 to 1913. He was also a member of the Committee on Buildings and Plans from 1912 to 1927; of the Nominating Committee from 1920 to 1927; and of the Pension Board from 1916 to 1927. Throughout his Trusteeship, he was intensely interested in all of the activities of the Museum and was always earnest and painstaking in his duties as a member of the various committees.

His advice and hearty cooperation were always valuable, especially where the welfare of our employees was concerned.

The same qualities which distinguished him as a Trustee of the Museum made him a valuable and influential citizen in the community.

His colleagues on the Board greatly miss his genial presence and valuable counsel.

CHARLES SPRAGUE SARGENT, dendrologist, died on March 22 after a two weeks' illness, at his Brookline estate, Holm Lea. Had he lived until April 24, he would have been eighty-six years of age. He had been director of the Arnold Arboretum since 1872, and professor of arboriculture at Harvard since 1879. The books by which he is best known are his *Manual of Trees of North America*, and his elaborate *Silva of North America*. He was generally recognized as the foremost authority on trees, and the American Museum of Natural History was fortunate in having him plan the Jesup collection of North American woods. He was aided in this work by his wife, who made the colored drawings of the foliage, flowers, and fruits. Mrs. Sargent died eight years ago. An excellent bronze bust of Professor Sargent, by C. S. Pietro, stands at the entrance to the Forestry Hall of the American Museum.

ASTRONOMY

ASTRONOMICAL SOCIETY FORMED AT THE AMERICAN MUSEUM.—The need for an amateur astronomical society in New York City was overwhelmingly demonstrated by the attendance of more than 500 people at the initial meeting called for the purpose of organization. The meeting was held in the American Museum of Natural History on the evening of May 10, and was presided over by Dr. Clyde Fisher. Professor Henry Fairfield Osborn, president of the American Museum of Natural History, made the welcoming address. He stated that the greatest gift a philanthropist could bestow for the intellectual uplift of the community would be money for the construction of an astronomical hall for the Museum, where the public could study the marvels of the sky. Other speakers were Dr. Oswald Schlockow, district superintendent of public schools of New York City; Mr. John A. Kinsbury, secretary of the Milbank Memorial Fund; and Mr. George H. Sherwood, director of the American Museum of Natural History.

Of the audience present, 340 signed applications for membership. President Osborn asked to be enrolled as the first life member, and his request was followed by a dozen others. Additional applications are steadily coming in every mail with suggestions and good wishes from every source.

Doctor Fisher was elected temporary president.

The next meeting will be held at the American Museum of Natural History on Thursday evening, May 26, at 8:15 o'clock.

A SERIES OF PAINTINGS in oil illustrating the magnificent prominences of the chromosphere of the sun has just been placed on exhibition in the Pro-Astronomic Hall. They are the work of Mr. Howard Russel Butler, N.A., who painted the three solar eclipses as well as the Lunar Landscape and the Aurora Borealis.

The chromosphere of the sun is composed of the light gases, hydrogen and helium, which float above the photosphere. These gases, being incandescent, have a wonderful rose color and are frequently, by explosive action, thrown high above the limb of the sun, sometimes as much as several hundred thousand miles. These eruptions are known as hydrogen prominences. They are constantly occurring and take on extraordinary forms.

They were first seen during total solar

eclipses, when the moon obscured the photosphere and made visible the prominences and the corona. Now they can be seen in the spectrohelioscope, an invention of Dr. George E. Hale, who has erected an observatory in Pasadena for the use of his instrument.

Mr. Butler had the good fortune to see the hydrogen prominences of the eclipse of June 8, 1918, at the United States Naval Observatory Station at Baker, Oregon. He then made careful notes of the color as seen by the naked eye and through a powerful field glass. He has also had the opportunity of studying these phenomena through Doctor Hale's spectrohelioscope. He conceived the idea of a frieze of hydrogen prominences to be placed ultimately in the proposed Astronomic Hall. The extraordinary forms and the vivid coloring produce a most decorative effect, and by varying the scales in the pictures, a uniform arrangement is obtained.

On the east wall of the Pro-Astronomic Hall are shown the great prominences observed during the eclipse of 1918, commonly known as the "Heliosaurus" and the "Eagle." The former was about 400,000 miles long and reached a height of 47,000 miles. The scale of this picture is one inch to 1700 miles and the lunar diameter used in the picture is forty-three feet.

On the west wall is a series of five paintings, the central one representing the great explosion of hydrogen that took place April 25, 1895, as recorded at Kenwood Observatory, and which attained a height of 281,000 miles. The scale of this picture is one inch to 5600 miles. Other pictures of this series represent the eruptions of September 23, 1919, as recorded at Yerkes Observatory. The scale is one inch to 1700 miles. July 9, 1917, based on a photograph taken at Mount Wilson, the scale being one inch to 2500 miles. October 8, 1920, at Yerkes Observatory, one inch to 2400 miles. July 15, 1919, Yerkes Observatory, one inch to 5300 miles.

In each case Mr. Butler has placed a disk representing the relative size of the earth, which runs from the size of a silver dollar to a disk $4\frac{1}{4}$ inches in diameter, showing that the earth in every case is insignificantly small in comparison to these gigantic tongues of incandescent hydrogen. A system of lighting has been used which makes the prominences glow like fire.

These two gorgeous friezes make a most attractive exhibit and already many visitors

are enjoying them. Eventually, they will be installed in our proposed Hall of Astronomy.

ANCIENT METHODS OF MEASURING TIME.—A unique collection of ancient and modern sundials, hour glasses, and astrolabes has been placed on exhibit in a special case in the Pro-Astronomic Hall. Unusual material for study is provided in the variety of instruments and the wide range of time covered in their manufacture. Silver pocket dials with compass, delicately engraved, a French astrolabe by Reinold, dated 1581, for observing the altitudes of planets and stars, an instrument used by mariners called "gnostique" which was designed by Messin in 1615, Chinese sundials and ancient Japanese pocket dials and compasses are shown, as well as examples of ivory book dials, and two universal ring dials, one by Chapoto, Paris, dated about 1600, the other English, dated 1620.

BIRDS

THE CHAPIN-SAGE EXPEDITION.—In a letter recently received from Dr. James P. Chapin he writes that in company with DeWitt L. Sage they secured, on the mountains of Ruwenzori, most of the montane species of birds known to occur on the explored eastern side. In describing the progress of his work Doctor Chapin writes that he found, while descending from the heights of Ruwenzori, anything but uniform conditions. In making the ascent of the slopes one traverses "life zones." Circling about the base one passes from one "faunal area" to another and then on to a third which may belong in a distinct subregion of the continent, for Ruwenzori is virtually a wall rising between east and west Africa. On the return trip the expedition traversed the band of lowland forest (a long day's march in width at its narrowest place) which extends from the Semliki River up the western slope of Ruwenzori till it merges with the montane forest. North and south of this band are areas of almost impenetrable elephant grass, with many west African birds.

Still farther south, along the base of the range, the grass grows finer and the savannas become covered with large acacia trees. This is the most pleasing country of the whole region, and it begins to exhibit east African birds. Rounding the south end of the range and approaching Katwe, the plains become still more open, with only large clumps of tree-euphorbias. If this district were in more direct communication with the arid

areas east of Lake Victoria, it would doubtless have zebras and ostriches. This type of country invades the Congo just along the northern shore of Lake Edward, bringing with it many east African birds.

In all about one hundred days were spent in the whole region of Ruwenzori. Of that time nearly one half was spent in arduous travel. On forty days of the trip a fair day's march was made without counting excursions from camp in search of birds. On some days the party climbed as many as 4400 feet, and once climbed 3500 feet and then down again the same distance.

Doctor Chapin and Mr. Sage have not suffered from any tropical ailment, or indeed from any other.

The following excerpts from Doctor Chapin's letters describe vividly some of the experiences of the expedition.

Mt. Itereré, 14,300 ft.,
West Ruwenzori, Nov. 26, 1926

MY DEAR PRESIDENT OSBORN:

You gave me my first taste of mountain-climbing when you sent me with George Bowdoin to the Canadian Rockies in 1915. And now my old longing to see Ruwenzori has been fulfilled. Of course the birds are the special reason for my being here, but who would not be thrilled by snowcaps and glaciers in such profusion as here?

We have pitched a little tent on a mountain-top; it is evening now and I am keeping warm by a little oil stove. But from this point, when the continual fogs permit, one sees mounts Stanley and Baher gloriously displayed at about six miles distance up a deep valley.

Today, by climbing a mountain 15,000 feet high, directly between here and Mt. Stanley, I had as splendid a view as one could desire, peaks weighted down with tremendous caps of snow, glaciers hanging in valleys so steep that one wonders why they don't fall, sheer black cliffs, rock slides, and below us, glacial lakes. The highest lakes on Kenya and Ruwenzori are not robin's-egg blue as are the lakes in Europe and America, but olive-green, for some curious reason. Just below this camp is another lake, nearly black.

Sage and I first came up here together, and deposited a bottle where other travelers (including my friends Bequaert and Heller) have done in the past. This is the end of the trail, and not much of a path at that, five days for carriers from the base of the mountain at 4000 feet. Then Sage come up to spend a night, because the best chances of seeing the peaks are at dawn and sunset. Now I have had my turn here, and have been favored exceptionally by the weather.

Here we are in the Senecis zone, which corresponds to the Paramo of the Andes. From 13,200 feet down to 9500 feet is the zone of tree heaths and wet moss, truly a terrible place

now, wet and cold, almost devoid of birds. Sage is in our camp at 12,300 feet waiting for me. I pity him. There is not a level spot for a tent; like all that zone of vegetation it is a mess of old dead heath trunks, buried in wet moss, with holes everywhere. Getting from our tent to the fly that serves as kitchen and dining room, I have twice fallen through to my waist. Today is the first day since we have been on the mountain (nearly two weeks) that I have been dry all day.

Below the heath zone are the bamboos and ordinary mountain forest, where birds are abundant. But below the mountain forest and extending up to 6500 feet in most places, is the elephant-grass, another disagreeable tangle.

So the mountain has its glories, and its discomforts. I should not use mountain in the singular, Ruwenzori is a whole range, 50 miles long, with almost innumerable mountains. It is great to be here.

* * * * *

Kalongi, 7000 ft., West Ruwenzori (highest village in Butagu Valley)

December 22, 1926.

DEAR MR. SHERWOOD:

Just a month after the sad event, I received a letter from an old friend, Mr. Boyton, then at Rutchurn, telling us of the death of Akeley on Mt. Mikeno. I know no details, save that Boyton said it was from the effects of dysentery. But having seen so much of Akeley in East Africa, we felt a great shock at the suddenness of this bad news. We were not even sure that he was back in the Kivu. . . .

After many delays, we actually began to climb the mountains here on November 14. It was still raining hard. At Kalongi we camped in a cascade of mud, in fact it was so uncomfortable that we had our porters build us a house of bamboos and grass while we were waiting for a guide and a few mountain porters to take us higher up. At 9000 feet we had a fairly comfortable night's camp, but up in the tree-heath zone, at 12,000 feet, it was miserable. Cold and wet, not a level spot for a tent, fallen trunks with holes between them buried in moss.

At 13,800 feet, the end of the trail, we had brief glimpses of the peaks through clouds. This was on November 23. We went down to the tree-heaths again, and were miserable. Again Sage went up on the 25th. There came a sudden change in the weather. The peaks stood out in all their glory. On the 26th it was dry and warm, and I climbed to 15,000 feet.

Lack of food for the men forced us to come down to this camp. The dry season is now securely established. We have busied ourselves collecting, and have secured many fine birds (including *Francolinus nobilis*, *Maliconotus lagdeni*, *Caprimulgus ruwenzorii*, and *Micropterus aequatorialis*) a number of rodents and so on.

We hope to get enough men and food together to make another quick trip up to 15,000 feet, if not to the snow line. Then we

shall be ready to return to the Semliki Valley and Beni, to continue on towards the Kivu. There is now a road to the west of Lake Edward, and no one travels by way of the lake any more.

15,000 ft., West Ruwenzori
Jan. 4, 1927.

DEAR PRESIDENT OSBORN:

I believe I wrote you from Mt. Itereré on November 26 last, and told of climbing to 15,000 feet. Now I am camped on that mountain and have just returned from a days' trip across the deep valley northeast of us, to the glaciers of Mt. Stanley.

One very large glacier descends to about 14,800 feet, not more than a mile from here. I was able to climb up alongside it to 15,500 feet when I found myself between two large glaciers, for another one flows down to the northward.

Above me towered the snow-covered Alexandra Peak, and no mountain scenery has ever seemed wilder to me. Overhead two ravens circled and cawed, justifying a bird-lover's presence amid these remote rivers of ice.

DeWitt Sage is waiting for me down the mountain. We could not secure enough porters for both of us to come up this time together. Our work on Ruwenzori has been brought to a successful conclusion, and we shall go back at once to the Semliki Valley.

Kalongi, 7000 ft.,
West Ruwenzori,
January 7, 1927

DEAR DOCTOR CHAPMAN:

We now move toward the Kivu, but you have no idea how difficult travel can be—and how slow—in this part of Africa. No beasts of burden save negroes. No roads worthy of the name, and long delays in every post. It usually takes twelve to fourteen days to get the porters we need, and they have to be changed about every seven days.

From the heights of Ruwenzori I once made out two of the Kivu volcanoes across Lake Edward, but the day after Akeley's sad death, a friend in the Kivu wrote me of it, and the letter took just one month to reach me on the slopes of Ruwenzori.

I think it is easier to work in the Kivu volcanoes than on Ruwenzori, distances are shorter, natives more plentiful, as well as food. But it is almost impossible to say how long our work will take there.

. . . The Belgians have done everything possible for us, even to giving us free hunting license (*Permis de Chasse Administratif*).

This trip has been the realization of some of my finest dreams, and I cannot tell you how grateful I am to Mr. Sage and also to Doctor Sanford for arranging it.

THE LIBRARY ACQUIRES A RARE BIRD BOOK.—Through the generosity of Mr. Ogden Mills the Library has acquired the excessively

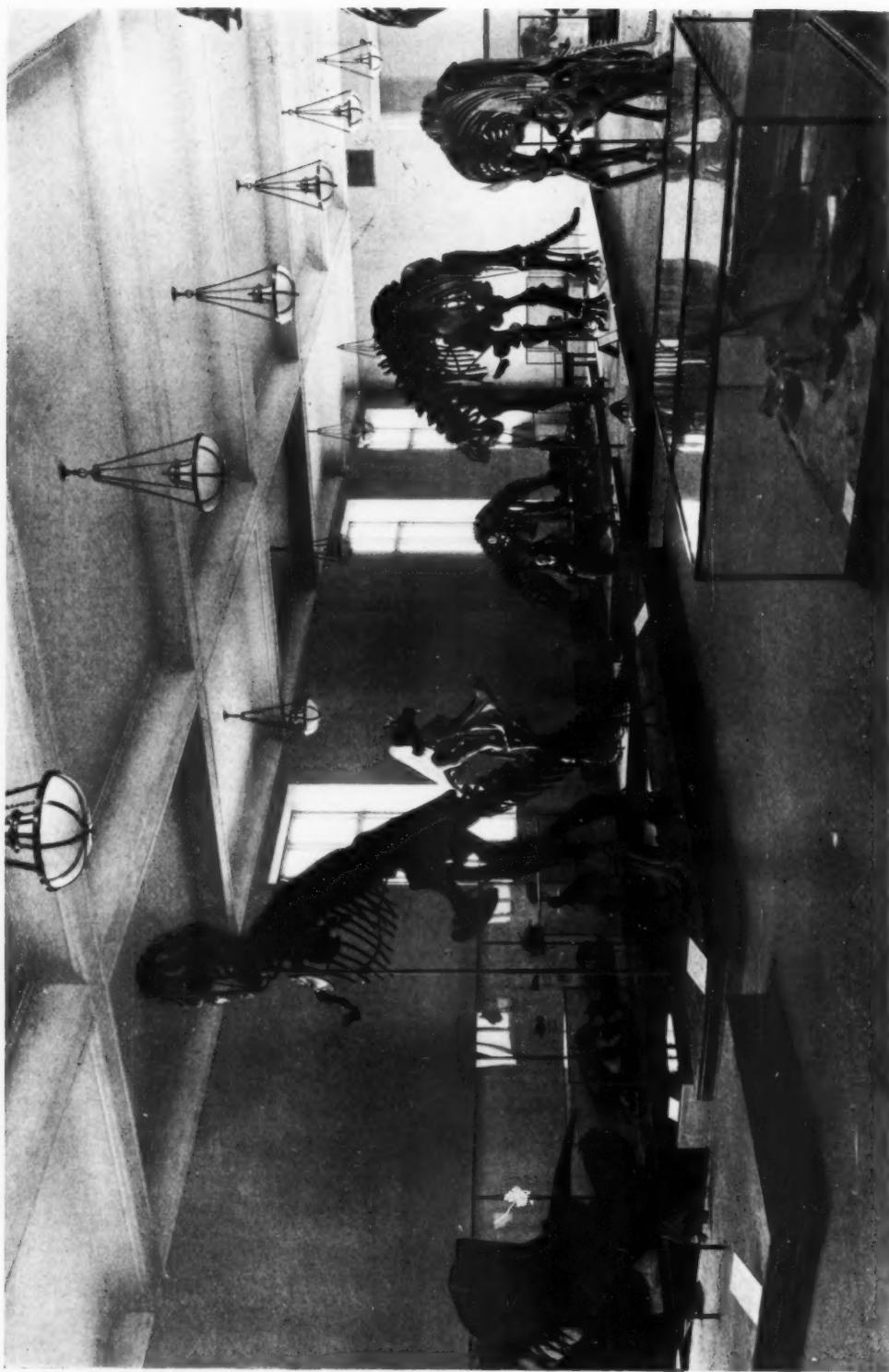
rare first edition of William Turner's *Avium Præcipuarum, Quarum apud Plinium et Aristotelem mentio est, brevis & succincta historia*—Coloniæ, 1544. Turner has been styled the father of British ornithology and this is the first book on birds which treats the subject in anything like a modern scientific spirit. His object in writing the book was to determine the principal kinds of birds named by Aristotle and Pliny. He has added copious notes, the great value of which consists in the fact that he is always careful to tell whether he observed the birds he describes in England or elsewhere. For this reason his comments are of great historic importance to the student of ornithology.

FISHES

A MOTION-PICTURE FILM OF THE WHALE SHARK *Rhineodon typus*.—In the summer of 1926 Mr. Mack Sennett, motion-picture producer of Los Angeles, California, led into the Gulf of California an expedition equipped with a newly invented submarine motion-picture camera. With this he made the most remarkable film of fishes in their aqueous abode that has ever yet been produced. Through Mr. William Beebe's influence this film was shown before the Museum staff. Some fifty feet of it portrays a whale shark majestically swimming along. Doctor Gudger got in touch with Mr. Sennett and he has kindly presented to the Museum through Doctor Gudger that part of the film picturing this great shark. The film has been studied at slow speed and found to give the details of practically all the structures of *Rhineodon* except those of the tail. Data for this are at hand and Doctor Gudger thinks that we are now ready to go forward with the completion of our model of this great shark.

MAMMALS

THE IRVING K. TAYLOR EXPEDITION.—A cable from the Taylor Expedition stated that the party had reached its destination on the White Nile and had then turned back. On the way they had to fight their passage through the sudd, that dense mass of vegetation swept down by the White Nile, which at times completely chokes the river and has been known practically to fill the river bed for miles. The obstruction has been removed several times with great labor and at great expense in order



THIRTY-SIX YEARS AFTER THE FOUNDING OF THE DEPARTMENT OF VERTEBRATE PALEONTOLOGY
Opening of the Dinosaur Hall, on the fourth floor of the new Asiatic Wing. This hall is one of eight which will encircle the southeast court of the American Museum. These will give a complete life-history of the earth.

to permit steamers to ascend the river. Mr. Taylor reports that, because of it, for three days they could do nothing but sit on the pilot-house and look for animals they could not go after.

The expedition has been successful in obtaining the specimens that they originally planned for, including about 200 mammals, more than 400 birds, and some fishes and reptiles, and only one kob is needed to complete the series of antelopes. Mr. Anthony is busy making cases to hold the numerous skins, skulls, and skeletons that have been collected and are drying on board. Three skinners are employed, as everything must have immediate attention after being killed to keep it from spoiling. The expedition has secured 2100 feet of motion pictures and more than 100 stills, but they were disappointed that at this season the waters of the Nile were so high that the whole region about it had grass from 6 to 15 feet tall so that even whole herds of elephants could be hidden from view in it.

Mr. Anthony writes that the expedition left for Port Sudan on April 4 for a month's hunting in the Red Sea Provinces. They will take reservations for England on May 17, and expect to reach New York early in June.

PROGRESS OF THE FAUNTHORPE-VERNAY COLLECTION.—Colonel Faunthorpe writes to President Obsorn from Bombay on December 3, 1926, regarding his recent additions to the Faunthorpe-Vernay Collection:

I am glad to be able to report that I have just completed the wild boar group with a very fine boar. You already have a sow and young one. The four horned antelope buck I hope to get. We have doe and fawn. These small animals are much more difficult to get, when you want them, than the big ones. For instance it took a lot of work to get a good parah (hog deer) stag last winter.

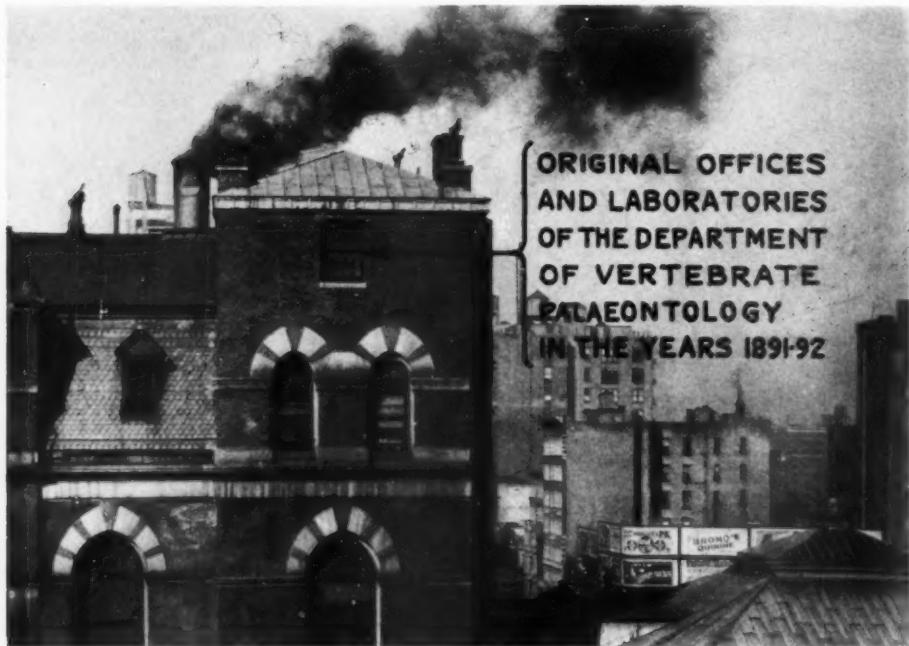
I have a special expedition planned for wild dogs in February; it is *very* difficult to get shots at these brutes. I have an idea for a group of red dogs (*vide* Kipling) pulling down a sambur or attacking a leopard which would be a great attraction I think. The dogs chase and kill leopards I know. The jungle tribes say they also chase and kill tigers but there is no *authenticated* instance of this on record. I spent a week last winter hunting them without result.

MR. S. H. CHUBB, of the department of comparative anatomy, is now engaged in mounting the skeleton of a large Russian wolf hound in a running position, which is to be placed near the skeleton of the running horse.

EXTINCT ANIMALS

THE HALL OF DINOSAURS.—The opening of the Hall of Dinosaurs on March 9 was the occasion of a nationwide celebration through the press and locally through crowds of visitors of all ages, numbering nearly 19,000 people on Sunday, March 13. The opening ceremony included a brief address by the President, who told of the thirty years of labor involved in making this great collection, and paid a very high tribute to Curator Barnum Brown, to whom the greater part of the collection is due. In the summer of 1897, the half skeleton of *Diplodocus* was found in the Como Bluffs and a year later the famous Bone Cabin Quarry was discovered and worked for many years. This is the largest single deposit of dinosaur bones, with the exception of the great quarry at Vernal, Utah, which has yielded so many fine skeletons. The first great achievement of the department was the mounting of the skeleton of *Brontosaurus*, at the time considered a great event, which made known the existence of dinosaurs to the entire people of the city of New York and, in fact, throughout the country. At the time, probably not nine people in this city knew what a dinosaur was, while now "dinosaur" has become a household word. The arrangement of the Hall of Dinosaurs has been in progress during the past year and the south end of the hall is in its final arrangement. The north end of the hall, however, is only temporarily arranged at present, since this section will in time be devoted to the Jurassic dinosaurs exclusively. The impression that has been created, as shown in the accompanying photograph, is certainly a majestic one.

In connection with this celebration, it is interesting to recall the very modest beginnings of the department of vertebrate paleontology in the small attic room of the old section of the building. Here, at the top of an elevator shaft, Curator Osborn and Assistant Curator Wortman worked for two winters cleaning up and preparing the first collections made by Curator Wortman in the Wasatch Beds of Wyoming. From this small beginning and this simple collection, the department has expanded during the last thirty-six years until now it is planned to fill six great exhibition halls, surrounding the southeast court of the Museum. The collections already amassed will more than fill these great halls. The building activity of the City can hardly keep pace with the world-



The modest attic room of the American Museum, in which the department of vertebrate palaeontology was founded in the year 1891.

wide collections made yearly by the department of vertebrate palaeontology.

MEETINGS OF SOCIETIES

AMERICAN PHILOSOPHICAL SOCIETY.—President Henry Fairfield Osborn represented the American Museum, the Cambridge Philosophical Society, and the New York Academy of Sciences at the two hundredth anniversary of the founding of the American Philosophical Society, held at Philadelphia April 17-30. He received the appointment of vice-president of the society. At this meeting Dr. Roy Chapman Andrews was elected to membership.

The Friday evening session was devoted to an address by President Osborn on "Recent Discoveries Relating to the Origin and Antiquity of Man." During other scientific sessions papers were read by Dr. Clark Wissler on "Age Changes in Anthropometrical Characters during Childhood and Adult Life," and by Dr. W. K. Gregory on "The Origin of Man from the Anthropoid Stem—When and Where?"

NATIONAL ACADEMY OF SCIENCES.—At the annual meeting of the National Academy of Sciences, held in Washington the last week of

April, Prof. William K. Gregory was elected to membership.

PAN-PACIFIC CONFERENCE.—Mr. Chauncey J. Hamlin, a Trustee of the American Museum, represented the Museum at the Pan-Pacific Conference on Education, Rehabilitation, Reclamation, and Recreation, held in Honolulu, during the week of April 11-16. This conference was called by the President of the United States in conformity with a joint resolution of Congress for the following purposes: (1) to establish a basis of co-operation for the promotion of peaceful arts and pursuits among the countries participating; (2) to provide a medium for exchange of knowledge on the subjects under discussion; (3) to afford a wider field of service for certain technical activities; (4) to be of assistance to the territories of the several participating countries.

JOHN BURROUGHS MEMORIAL MEETING.—John Burroughs' ninetieth birthday anniversary was observed on April 2, at the annual meeting of the John Burroughs Memorial Association in the auditorium of the American Museum of Natural History. Dr. Clyde Fisher, president of the association, presided.

A feature was the presentation of the medal of the association to Ernest Thompson Seton for his four-volume work *The Lives of Game Animals*. This medal is awarded each year to the author who has produced what is considered the best piece of nature literature.

At a business meeting which followed the program, the officers and six members of the Board of Directors were reelected. Professor William Lyon Phelps of Yale University was chosen director.

PROFESSOR OSBORN'S RESEARCH CLUB

THE RESEARCH CLUB of the American Museum has continued its weekly meetings throughout the past season. The purpose of these gatherings is to give the staff members opportunity to discuss informally reports of current biological investigation in this and other institutions.

PAPERS PRESENTED DURING 1926-1927

THE PRESENT STATUS OF THE ORIGIN OF MAN.—In describing the present status of the origin of man, Dr. W. K. Gregory discussed the three theories concerning man's origin: (1) the aboreal, (2) the independent terrestrial, (3) the polygenetic. He stressed the anatomical evidence, especially that to be derived from the brain, the hand, and the foot. He discussed the dentition of *Dryopithecus*, and concluded that man's ancestors were undoubtedly arboreal and probably closely allied to that genus.

INVESTIGATIONS IN EAST ANGLIA.—Prof. Henry Fairfield Osborn discussed the rostrocarinate flints found by Mr. J. Reid Moir at the base of the Red Crag formation in England. They were very probably fashioned by human beings who lived before the end of the Pliocene. Professor Osborn has made a very thorough field study of Pliocene man in England.

EPIOME OF RECENT RESEARCH WITH REGARD TO THE ANTIQUITY OF MAN.—Prof. Henry Fairfield Osborn declared that man is ten times more ancient than we formerly imagined. As a result of the discoveries of tools and ornaments in Nebraska, he is led to believe in the great antiquity of man as a tool maker. Man may now be carried back to this country to the Middle or Lower Pliocene. The ape family very early branched off from the anthropoid common stock, the apes becoming more aboreal and the human

stock more terrestrial. Until more evidence comes to light, *Dryopithecus* should be placed on the ape side of the fork.

EVOLUTION OF MAN BY FOETALIZATION.—In Dr. L. Bolk's recent book, man's evolution is described as essentially a process of foetalization or retarded development. Dr. Harry L. Shapiro strongly disapproved of this point of view. The Chihuahua hairless dog has its skin devoid of hair, but who would describe the beast as representing the foetus of another variety? Many of man's structures are less specialized than those of the apes, but many others, such as his nose and brain, are more advanced. Mongoloid idiots and cretinous individuals may be foetalized, but not our friends and colleagues.

EVOLUTION OF MAMMALIAN MOLAR TEETH.—Two papers on this well known and much debated subject were discussed by Dr. H. E. Wood, 2d. The first, by Dr. W. K. Gregory and G. G. Simpson, on some Cretaceous mammal skulls from Mongolia, is of the greatest interest, for it describes the first good Mesozoic mammal skulls ever found. The authors are to be congratulated on their paper. The second paper presented was a review of the premolar analogy theory. It was written by Doctor Gregory and described ten structural stages in the origin of man's dentition.

THE SIWALIK BEDS.—Dr. W. D. Matthew gave a report of his recent investigations of the fossil fauna from the Siwalik beds of northern India, including a list of correlations between this fauna and other faunas.

ORTHOGENESIS.—Prof. Henry Fairfield Osborn reported a remarkable case of directional evolution as illustrated by the skull of a Mastodon recently found in Nebraska. This skull, which was more than six feet in length, has an extraordinarily elongated lower jaw with shovel-shaped incisors. The specimen represented an extreme development of the Palaeomastodon phylum of Proboscidea.

EVOLUTION BY LAW.—Prof. Leo O. Berg has published a book on "Nomogenesis," or "evolution by law." It did not appear to Dr. E. W. Gudger, who reviewed the book, that Berg has discovered what this law, or laws, might be. To state that evolution is the result of certain inherent processes acting according to laws is merely restating the problem in other terms. To rule out chance and natural selection in evolution is absurd.

THE MECHANICS OF VERTEBRATE DEVELOPMENT.—Dr. G. Kingsley Noble reviewed the epoch-making work of Spemann and his associates on the "organizers" of development.

MUTATION OF SPECIES.—Dr. Willard G. Van Name discussed the classical studies of W. Schmankewitsch on the transformation of the little crustacean, *Branchinecta*, into *Artemia*, by increasing the salinity of the water. He pointed out that more recent investigations had showed that this was actually not the transformation of one genus into another, but merely the modification of *Branchinecta* by severe treatment.

FIELD STUDIES OF SOUTH CHINA AMPHIBIA.—Mr. Clifford H. Pope described the breeding habits of the frogs and toads of southeastern China. He stressed the habitat preferences of the forms considered and indicated the importance of these preferences in evolution.

THE MIGRATION OF BIRDS AND FISHES.—Dr. R. C. Murphy and Mr. J. T. Nichols led a discussion on the modes and causes of animal migration. Doctor Murphy reviewed some of the recent papers of Wetmore, Rowan, Wachs, and Thomson. He pointed out that, while the maturing of the gonads might be considered the releasing mechanism of migration, the nature of the stimulus inducing and directing the periodic movements of animals was unknown. Mr. Nichols compared bird and fish migrations. The temperature factor is of great importance in the movements of fishes. Further, fishes often migrate to feed and not necessarily to spawn. Prof. Selig Hecht compared the migration of new-born turtles into the sea with other types of migration, especially with regard to the directing factors concerned.

CLASSIFICATION OF NORTH AMERICAN BIRDS.—Mr. De W. Miller reviewed the work which he and Doctor Wetmore have been pursuing on the classification of birds. Gadow's classical studies serve as a basis for their final scheme, but recent discoveries have aided in making this system a more natural one.

DISTRIBUTION OF CENTRAL AMERICAN BIRDS.—Mr. Ludlow Griscom reported on his recent field work in Panama and discussed the problem of life zones in Central America. The Caribbean and Pacific bird faunas are unlike. This finds its basis chiefly in the different vegetation zones. Mr. Griscom is mapping the

life zones of the region and has made considerable progress in this work.

THE FAUNA OF ANGOLA.—Mr. Rudyerd Boulton reported on his recent field work in Angola. He discussed the distribution of the bird and fish faunas of this country. Field observations on the nests of palm swifts and upon the mimicry of the drango by a flycatcher were of great interest.

FIELD STUDY ON BIRDS IN PANAMA.—Dr. Frank N. Chapman gave an inspiring address on research possibilities at the Barro Colorado Station. During the last season he made a detailed study of the habits of a colony of oriole-like birds, *Zarhynchus*. He emphasized the great importance of bringing back ideas to the Museum, as well as specimens. The former are frequently more important by far in advancing biological knowledge. Doctor Chapman also availed himself of the opportunity of making observations on mammals and ants. His report was illustrated by a series of impressive photographs.

NEW BOOKS

Fishing from the Earliest Times [to 500 A.D.], by William Radcliffe.—So great was the demand for the first edition of this remarkable and invaluable work (which I reviewed in this journal in 1923) that a reprinting became necessary. Fortunately author and publishers (Murray in London, and Dutton in New York) took advantage of the opportunity to make this a new edition and thereby have made the fishing fraternity and all who are interested in the early history of angling their everlasting debtors. In this second edition the few errors of the earlier issue have been corrected, additional data brought to light by later researches have been incorporated, and best of all, a bibliography has been added including works published as late as 1926.

In my review of the first edition, I referred to it as a source book of the greatest value and expressed regrets that the author had not given a bibliography in definite form, instead of putting his references as footnotes. This Mr. Radcliffe has done in the new issue, and the fifteen closely printed pages of references to 430 authors are of the greatest value to the student who wishes to consult the original sources. Incidentally, it gives one a clear idea of the enormous amount of reading and re-

search which the author has done to get the materials for his book, and hence is an index of its thoroughness and value. Unfortunately the author has not chosen to accept the other criticism made by myself and others—to add to his title page the date bracketed at the beginning of this review, and thus clearly to delimit the extent of his researches.

One cannot put too high an estimate on this unusual book. That others agree is shown by the fact that in ten days after issue, 1250 copies of the new edition were sold. It is now, and for many long years will continue to be, the standard work dealing with the archaeology of angling. And since the work ends with the year 500 A.D., I join with many others in wishing that Mr. Radcliffe might give us a second volume bringing the subject down to the present time.

No angler interested in the history of his art can afford to have this work absent from his bookshelves. Also to it must go students interested in ichthyolatry and ichthyophagy among the ancients, in the latest data concerning the Christian and other ancient fish symbols, in the curious mediaeval figures of Jonah and the whale, in the efforts of the Roman emperors to fix the price of fish, in the fish taboo in Egypt, in the earliest recorded contract of fishing, and in the charming stories of the dolphin and the school boy. These and many other equally interesting subjects are all to be found in Mr. Radcliffe's book.

—E. W. GUDGER.

Fresh-water Fishes of Hainan is the subject of a paper by John T. Nichols and Clifford H. Pope, now on press. Thirty new forms are described, all of which were collected by Mr. Pope on his trip to Hainan in 1922. All the fish known from Hainan are included, and each description is accompanied by a line drawing. These sketches add greatly to the value of the paper, and it is hoped the publication will encourage further investigation of this interesting fauna by Chinese students in South China. This paper completes the report on new material brought to light by preliminary study of all fish collections of the Third Asiatic Expeditions, excepting those obtained by Mr. Pope in Fukien Province, 1925-26, which reached the Museum only last December.

A NEW HANDBOOK on the home aquarium has just been published, *Fishes in the Home*, by Miss Ida M. Mellen of the New York Aquar-

rium (Dodd, Mead, & Co.). Whereas there are a number of authoritative books on this subject, the present small volume of 178 pages should fill a distinct need and have wide circulation. It is attractively printed and illustrated, very readable, and contains much practical information. Anyone who keeps fishes in an aquarium will enjoy reading and later have occasion to refer to it in detail, in such matters as stocking, care, and feeding, or treatment of sick fishes. In view of the varied subject matter therein contained, it is much to be regretted that the book is without an index. Though lacking the compass for an exhaustive treatment of aquarium fishes, a very fair survey is presented of those species from various parts of the world appropriate for aquarium culture. The home aquarium offers an opportunity such as is obtainable by no other means to have close at hand a bit of wild nature, for instance, a fragment of scintillating aquatic life from the tropics of one or the other of the three major continents, Asia, Africa, America.

A salt-water aquarium offers so many difficulties compared to the fresh-water, that it should be undertaken only by persons in a position to give the matter some time and study. These will also be interested in *A Handbook to the Marine Aquarium*, a pamphlet of 69 pages just issued by the Horniman Museum and Library, Forest Hills, S. E., London. It is possible, though not an easy task to keep in an aquarium various forms of marine invertebrates as well as fishes for study, creatures of rare beauty, as well as interest. This handbook further contains contributions to the life-history or habits of several forms of British marine life.

—J. T. NICHOLS.

*How to Hunt with the Camera.*¹—To the devotee of the camera any new book on the subject of photography holds an irresistible appeal; to the individual who knows little or nothing about the instrument, yet who loves nature in all its forms, photographs of living animals, birds, insects, and flowers shown in their haunts, give a thrill of pleasure and perhaps of wistfulness to know something of the art whereby such scenes are caught and imprisoned in a photographic negative. To both of these, *How to Hunt with the Camera* has been addressed by William

¹*How to Hunt with the Camera.*—A complete guide to all forms of outdoor photography. By William Nesbit. E. P. Dutton & Co., New York, 1926.

Nesbit. And not to these alone, but also to the sportsman and the hunter who, exchanging his gun for a camera, finds a keener joy in the satisfaction of his hunting impulse through the skill and patience demanded by this method of winning his trophies of the chase.

Mr. Nesbit has gathered together valuable information based on actual experience, and covering virtually all forms of outdoor photography. The illustrations include many fine pictures by Radelyffe Dugmore, Geo. Shiras, 3d, Martin Johnson, Carl Akeley, Frank Chapman, Raymond Ditmars, William T. Hornaday, Hobart Roberts, and other successful photographers of wild life.

Technical points are illustrated by carefully worked out diagrams, sketches, and photographs, and every effort is made to coach the picture huntsman for work under trying and difficult conditions. The chapters on cameras and lenses are especially practical.

A partial "Who's Who" includes short biographies of those, principally in the United States, who have been active in the field of nature photography.

—A. K. BERGER.

SCIENCE OF MAN

MR. REGINALD PELHAM BOLTON, who has long been distinguished for his archaeological and historical studies of Manhattan Island and its vicinity, and to whom the Museum is indebted for a large part of its archaeological collections from Manhattan, has presented an interesting series of archaeological specimens from the Cumberland Mountains in Virginia.

MR. GEORGE C. VAILLANT who has been appointed assistant curator of Mexican archaeology, expects to leave soon for North Africa and plans to return in time to take up his duties at the Museum about July first.

DR. WALDEMAR JOCHELSON, who has been the guest of the Museum during his visit to America, is now preparing to return to Russia, where he has accepted a position as division curator of the Museum of Anthropology and Ethnography of the Academy of Sciences, Leningrad, and as lecturer on Ethnology at the Leningrad University.

MR. ERICH F. SCHMIDT, assistant in archaeology, department of anthropology, has joined the field party of the Oriental Research Institute of the University of Chicago, to assist in an archaeological reconnaissance of Asia Minor.

DR. T. WINGATE TODD of Western Reserve University, Cleveland, recently visited the department of anthropology, spending some time in making age determinations for a large part of our prehistoric skeletal collections from Southwestern United States. About 500 skeletons were examined and it is expected that Doctor Todd will return some time in the future to complete his examination of the material.

SCHOOL SERVICE

FORMAL OPENING OF THE SCHOOL NATURE ROOM.—The opening of the School Nature League Room on May 3 in the new School Service Building of the American Museum was the fulfillment of a dream begun many years ago by the founders of the League.

As early as 1892 the seed of the School Nature League was planted by Mrs. John I. Northrop when she organized the Natural Science Committee of Hunter College Alumnae. Under Mrs. Northrop's leadership the idea grew, and in 1917 the School Nature League was organized "to increase a knowledge and appreciation of nature in the children of our public schools." Headquarters were established in P. S. 75, Manhattan, and a number of nature rooms were started in many schools throughout the city. In 1920 Mrs. Northrop wrote, "What we have done is just a beginning; there should be a nature room in *every* school." More than thirty nature rooms have now been established in New York City schools, and the seventy-third flower show of the League, May 3-5, marked the establishment of a permanent nature exhibition room, set aside by the American Museum especially for this purpose. A detailed account of the beginning of the Nature League was published in NATURAL HISTORY, Vol. XX, pp. 264-276.

Through the efforts of directors and friends of the League, a wealth of blossoms and plants were contributed for the flower show. Daffodils, jonquils, pansies, roses, snap-dragons, cacti and other interesting plants from California, Calceolarias, Magnolia, and Schizanthus were among the striking cultivated flowers; and wild violets, hepatica, trillium, jack-in-the-pulpits gave a delightful touch of the real out-of-doors. A prize was offered by the League for the best exhibit prepared by a public school, and this was won by P. S. 93, Amsterdam Avenue and 93d Street. The winning exhibit, entitled "Lincoln Camp," represented a woodland scene: a log cabin

surrounded by trees in which minature birds perched, rocks with a brown bear climbing over them, bushes which half-concealed a small deer, ferns in which a rabbit played, a mossy pond in whose waters wild ducks were swimming.

At the formal opening of the Nature Room Prof. Henry Fairfield Osborn, Honorary President of the League, paid tribute to the work of that organization and to its founder, Mrs. Alice Rich Northrop, and introduced its president Mrs. William C. Popper. After a brief address by Mrs. Popper, the children of P. S. No. 15, of which Miss Margaret Knox is principal, presented a spring pageant which was thoroughly enjoyed by an enthusiastic audience, and which reflected much credit to the children and to their teachers.

Interested friends are cordially invited to visit the School Nature League Room on the second floor of the School Service Building, to learn what is actually being done to develop knowledge and love of nature among the school children of New York City.

NATURAL HISTORY is hoping to publish in a later issue a more extensive article about the work of the League.

THE CANADIAN GOVERNMENT MOTION PICTURE BUREAU and the NATURAL RESOURCES INTELLIGENCE SERVICE DEPARTMENT have made the American Museum of Natural History the depository for ten reels of motion pictures and several lecture sets of lantern slides. These cover the industries, agriculture, and scenic beauties of the Dominion and will be circulated without charge among the public schools of New York City as are the other motion pictures and slides in the Museum's Visual Instruction Library. The films and slides now available are:

MOTION PICTURE FILMS

Apples of Annapolis.....	1 Reel
City of Loyalists.....	1 Reel
Digging up the Past.....	1 Reel
Harvest of the Sugar Maple Tree.....	1 Reel
Money-making Industry.....	1 Reel
Mountaineering Memories.....	1 Reel
Salmon Fishing on Restigouche River.....	1 Reel
Story of a Can of Salmon.....	1 Reel
Through the Norway of America.....	1 Reel
Where Beauty Dwells.....	1 Reel

SLIDES

Set 63—Newer Commercial Canada
Set 64—Canada—Coast to Coast
Set 65—Manufacture of Pulp and Paper
Set 66—The Canoe in Canada

Teachers desiring the use of these new materials in visualizing to their classes the natural and industrial resources of Canada or the geographical features of the Dominion

can obtain them upon application to Mr. George H. Sherwood, curator-in-chief, department of public education, American Museum of Natural History.

APPEAL FOR BACK NUMBERS "OF NATURAL HISTORY"

The Library of the American Museum receives frequent requests for complete files of *NATURAL HISTORY* which it is no longer able to furnish. Should any subscriber care to donate copies of earlier issues, the gift will be very much appreciated, and postage will be refunded to the donor. Address the LIBRARIAN, AMERICAN MUSEUM OF NATURAL HISTORY.

NEW MEMBERS

SINCE the last issue of *NATURAL HISTORY*, the following persons have been elected members of the American Museum, making the total membership 9505.

Associate Founder

Mr. WILLIAM J. MORDEN.

Associate Benefactor

Mr. JULIUS F. STONE.

Fellows

Mrs. JAMES B. CLEMENS.

Mr. WALTER P. CHRYSLER.

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Mrs. SARAH C. W. HOPPIN.

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Mr. J. ERNEST WILLIAMSON.

Sustaining Members

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Messrs. WILLIAM V. CREIGHTON, ROLAND L. DEHAAN, CHARLES M. FAIR, ARNOLD GOTTLIEB, F. E. HAGEMEYER.

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Doctor: CARRIE WEAVER SMITH.

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Misses: LOUISE AUCHINCLOSS, HESTER BANCROFT, GRACE C. BOWER, MINERVA DICKERMAN, MADELEINE I. DINSMORE, ELIZABETH FULTON, SARAH D. GARDINER, EDITH M. HADLEY, LAURA JACOBSEN, HARRIETTE MELISSA MILLS, ALICE L. SEIXAS, DELIA A. STEBBINS, ROSALIND WOOD.

Doctors: V. M. CADY, EDWARD L. DILLMAN, W. W. MORRISON, THOMAS W. SALMON, HENRY JAMES SPENCER, WALTER F. STILLGER, KENNETH B. TURNER, SOLOMON WIENER.
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Professors: FLOYD C. FAIRBANKS, P. W. FATTIG, M. C. FINDLAY, GAETANO ROVERETO.

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Master: DONALD PECHMAN.

THE SOUTHWEST NUMBER MAY-JUNE

The May-June Number of *Natural History* will be devoted principally to the archaeology of the southwestern United States. It will include a paper by Clark Wissler on the Aztec Ruin National Monument, and one by A. V. Kidder on the Cañon del Muerto excavations.

There will be a discussion by A. M. Tozzer on American archaeology, with special reference to the chronological aspects of archaeology in the Southwest and Middle-America.

Discoveries shedding new light on the antiquity of man in America are dealt with in articles by J. D. Figgins and Harold Cook, and Earl Morris writes about an aboriginal salt mine at Camp Verde, Arizona.

"North to 88 and the First Crossing of the Polar Sea" is contributed by Lincoln Ellsworth.

